FEEDSTUFFS

The Weekly Newspaper for the Feed Industry

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What Farm Proposals May Mean in Market Place

By JOHN CIPPERLY
Feedstuffs Washington Correspondent

WASHINGTON—This week President Kennedy sent to Congress temporary emergency feed grain legislation for the 1961 corn crop. This would raise the price support level of corn to $1.20 bu. national average basis. The levels of support for other feed grains would be raised comparably to the boost for corn.

At the same time, Agriculture Secretary Orville Freeman announced that he would increase the price support for the 1961 soybean crop to $2.30 bu. and that the cottonseed loan would be advanced proportionately.

The legislation requested of Congress is temporary and designed to increase farm income this year. The White House stated that later in the session it would submit long range legislation covering feed grains for future years and special legislation for wheat.

In transmitting the proposed feed grain legislation, President Kennedy asked Congress for action by Mar. 1.

The President, in his letter to Congress, describes the proposal as: (1) Providing cooperators in the feed grain program a price support level of $1.20 bu. for corn; (2) providing a special agricultural conservation program under which acreage previously planted to feed grains would be diverted from 1961 pro-

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Asks CCC Grain For Feed Men When Poultry Is Exported

KANSAS CITY—A proposal that government owned feed grain be made available to feed manufacturers whenever poultry is exported from the U.S. was made by John P. Bauer, International Sales Corp., New York, at the annual meeting of the Institute of American Poultry Industries. Mr. Bauer said his company, which is a firm of international sales agents, is now submitting this proposal to the U.S. Department of Agriculture.

Under the Bauer plan, whenever poultry is exported, the processors would obtain a certificate for an equivalent amount of feed grains, which could be passed on to the feed manufacturer for credit, the feed producer in turn collecting the grain from government supplies. Mr. Bauer said that it takes about 90,000 lb. of feed grains to produce 30,000 lb. of chicken meat.

The present U.S. export subsidies on feed grains make this grain available to foreign feed producers at a

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K.C. Feed Production Up 3.7%; Best Since '54

By MARTIN E. NEWELL
Feedstuffs Staff

KANSAS CITY—Production of formula feed in the Kansas City market gained moderately in 1960, according to figures compiled for the Kansas City Chamber of Commerce from nine milling companies in the metropolitan area. Output amounted to 577,618 tons, a gain of 3.7% over the previous year when production totaled 559,290 tons. It was the best

(Turn to PRODUCTION, page 8)

Farmers Plan 12% Jump in Egg-Type Chick Purchases

WASHINGTON — Farmers are planning to buy 12% more egg-type chicks this year than they did in 1960, according to Feb. 1 figures announced by the U.S. Department of Agriculture.

The USDA report confirms a prediction by the Poultry Survey Committee (Feedstuffs, Dec. 17, 1960) that egg-type chick hatch during the first half of 1961 would be 10-12% above a year earlier.

Expansion intentions are attributed to generally favorable egg prices in recent months.

Farmers in all regions intend to buy more chicks. Increases indicated are: 27%, South Central; 19%, West; 10%, both North and South Atlantic; 9%, West North Central, and 5%, East North Central States.

USDA says that some differences between Feb. 1 intentions and actual purchases are dependent on egg and feed price relationships and other developments during the remainder of the hatching season.

The government report states that farmers now plan to buy 24% of their chicks straight run, 70% pullet chicks and 6% cockerels. Last year they bought 24% straight run, 69% pullet chicks and 7% cockerels.

The favorable prices underlying the expansion plan included mid-January prices averaging 38.6¢ per dozen. That figure was down 5.5¢ from a month earlier but was still 9¢ a dozen higher than at the same time a year earlier.

Price Trend

Price trend in early January was down sharply on large sizes. Price trends during the latter half of the month were irregular, USDA said.

(Turn to CHICKS, page 113)

Californian Is New ADA Head

By THOMAS E. LETCH
Feedstuffs Staff

NEW ORLEANS, LA.—The American Dehydrators Assn. met here in the Jung Hotel Feb. 8-10 for its 19th annual convention. Approximately 270 registered and participated in the convention program. And when there were no ADA sessions, conventioners roamed this old-world city seeing the sights and entering into the pre-Mardi Gras celebrating.

The convention climaxed the ADA's biggest year. In their reviews of the past year, Joseph Chrisman, executive vice president, and J. M. Schrum, Sugarland Industries, Inc., Sugar Land, Texas, outgoing president, noted that membership, income and expenditures (primarily on research and promotion) had all set new highs.

Elect J. W. Fielder

New ADA president is J. W. Fielder, Dixon Dryer Co., Dixon, Cal. He moved up from first vice president and was succeeded in that post by William H. Healey, Gothenburg (Neb.) Feed Products Co. Harold R. Spencer, Iowa Valley Milling Co., Iowa City, Iowa, is the new second vice president, succeeding Mr. Healey. Mr. Chrisman and Miss Eunice Hunt, secretary, were reelected by the board.

Dr. William R. Kehr is the new chairman of the ADA Research Council. Dr. Kehr, who is with the U.S. Department of Agriculture Forage &

(Turn to ADA, page 4)

Fish Meal Prices Rise On Peruvian Quota and Lower U.S. Supplies

By JAMES W. MILLER
Feedstuffs Staff

NEW YORK—A tightening of crop year-end domestic supplies plus the initiation of a new Peruvian export quota system have caused a strong turn in fish meal prices over the past few weeks.

The domestic market for menhaden meal here stood this week in the range of $92@94, sacked, f.o.b. plants, with supplies limited and sales mostly subject to confirmation. This compares with the reported low point in the domestic market of around $78 ton back in December.

Imported meal from Peru was largely on a bid-and-ask basis because of uncertainty over how the Peruvians will operate under their new selling plan. Recent quotations ranged $92@95, sacked, f.o.b. cars, Gulf.

The world fish meal market has been jarred in recent years by the surge of Peru into a leading posi-

(Turn to FISH MEAL, page 113)

FEEDSTUFFS *Features This Week*

BEEF CATTLE NUTRITION—Summaries of beef cattle nutrition papers from the Southern Agricultural Workers Conference begin on **page 10.**

COPPER FOR SWINE—The use of high levels of copper for growing-finishing swine is discussed in an article on **page 40.**

NEW PLANT OPENS—Montana Flour Mills' new feed plant at Great Falls, Mont., is described on **page 73.**

A FIVE-YEAR LOOK—A look ahead at feed manufacturing and distribution from the manufacturer's point of view is found on **page 80.**

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Washington Convention

Panel Examines Long-Range Industry Trends

By ROGER BERGLUND
Feedstuffs Managing Editor

BELLINGHAM, WASH. — "Don't fight integration—join it. If you don't (in poultry at least), you'll be out of the feed business . . . Commercial feed production will continue to increase, but concentrates will become a larger proportion of the total . . . Feed manufacturing by farmers in grain areas will increase, but most will use a concentrate . . . No integrated operation has a chance of survival unless farm management is as good or better than that of competitors . . .

"Integration or coordination will continue to gain, but there may be an expansion of or swing back to feed specialization in some instances . . . More feed men will be their own best customers . . . Feed manufacturers can figure they will have to average at least 50% more tonnage per man and per dollar within the next few years . . . Decentralization and smaller plants serving nearby areas will continue to be a dominant trend . . . Feed manufacturing will become more technical and specialized, and this will discourage participation by growers, grocerymen and other integrators."

These are examples of some of the comments and predictions made by a

(Turn to WASHINGTON, page 112)

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The Quickie Feed Grain Plan

TRYING TO DETERMINE the probable effect of the administration's proposed feed grain program on animal agriculture and on the feed industry presents some acute problems in arithmetic, not to mention exercises is mind reading. A boost in support prices, as industry leaders have pointed out, would increase feeding costs and put a squeeze on producers of meat, milk and eggs. At the same time, however, the secretary of agriculture apparently expects to help finance the cost of higher supports by sales of surplus stocks at market prices. Commodity observers believe this will tend to lower prices, which in turn would encourage more feeding. The mind-reading is necessary to determine when, how much and in what manner the U.S. Department of Agriculture would put its stocks on the market.

The program appears to be patchwork proposal, put together with inadequate consideration of the total probable impact on livestock and poultry production, both for short-term purposes and the long-range health of the basic agricultural enterprise of the nation, production of the protective foods.

It is urgently hoped that the proposal will get the necessary close scrutiny of congressional agricultural leaders before something is dumped on the economy which could throw markets of all kinds into complete confusion. Unsettled price prospects could greatly disrupt the orderly growth of sound farming enterprises, tremendously outweighing any temporary benefit that might accrue to farmers as a result of jacking up feed grain prices. The administration—and Congress—should be fully aware that this sort of tampering with prices is just what has put the government in the present surplus jackpot.

It is apparent that the administration cannot resist the old call to demonstrate its desire to "do something" through the price support route—easily identified as a more-money-on-the-farm program because it can be neatly displayed as a cents-per-bushel boost. It is equally apparent that, in this admittedly temporary program, at least, the administration is not showing a proper regard for the possible adverse impact of its proposal on a basically sound animal agriculture industry.

Top of the Hopper

THE INDUSTRY LIAISON committee on Food and Drug Administration problems is pulling together its arguments and evidence for another meeting in Washington on March 7. It is hoped that a final decision can be reached on the problem of regulating the distribution of concentrates. Suggestions as to how the committee can substantiate its position that FDA clearance should not be required of local mixers and others using concentrates would be welcomed by the American Feed Manufacturers Assn. (See Feedstuffs, Feb. 4, page 1.)

The current FDA position that new drug applications must be held by everyone mixing a concentrate presents both an impossible enforcement problem for FDA and a heavy imposition of "policing" responsibilities on feed manufacturers. It appears to many in the industry that FDA's best bet is adequate regulation of the manufacture of concentrates and provision for specific mixing directions and labeling on concentrate shipments. This could accomplish FDA's purpose in a far more efficient manner than that now demanded by FDA.

AFMA is still working on an attempt to modify the Delaney clause—which is the source of the present perplexities. However, activity on this front has been somewhat overshadowed by the effort to overcome the concentrate problem.

Several industry associations are involved in a plan for a unified approach

(Turn to **TOP OF THE HOPPER**, page 109)

How's Business?

AN EVERY WEEK REVIEW OF FORMULA FEED BUSINESS VOLUME, INCLUDING PRICE, SUPPLY AND DEMAND TRENDS

Regional differences in the formula feed industry were obvious this week. While egg and dairy feed volume kept business rolling along in the Northeast and climbing broiler prices added optimism to an already favorable feeding situation in the Southeast, business in most other areas of the nation was down some from the week before—mostly because of spring-like weather.

This week's wholesale feedstuff price index of 81 was 0.5 higher than the week before and 1.9 higher than a year ago, according to U.S. Department of Agriculture calculations. USDA said the feed-grain index declined 1.2 points to 63.2, which compares with 63.9 a year earlier. Up to 16 went the Chicago-based hog-corn ratio. This was a gain of 0.1 from the week before. The new mark is 4.1 better than that recorded in the comparable week a year ago. (Feed markets in detail on pages 110-112.)

Northwest

Though it was a surprise to some manufacturers in this region, this week's feed business was a bit slower than the previous week's. But millers and dealers reported that this month's volume will add up to a bigger figure than in February of 1960.

Ingredient handlers said there was much room for improvement—despite the major lifts in animal protein and soybean oil meal prices.

A representative of one manufacturing firm contemplating a cut in production time said the work force reporting currently could handle considerably more business if it were available.

Some disagreement was noted in opinions of what feeds are moving best. But it was evident that poultry and hog feeds are at the top of the list. Mild, open weather was mentioned as one of the major factors discouraging greater use of formula feeds in beef cattle feeding operations.

Southwest

Formula feed business in the Southwest continues at about the same pace as last week which, while better than the same period a year ago, still leaves something to be desired. Mills are operating on a slow five-day basis.

Cattle feed business continues good in spite of the extremely open weather; however, some trade sources report that range feeding is almost over.

Mills report better than usual early turkey business and also an improvement in most poultry lines.

Hog feed sales are still good and some early promotions of pig feeds indicate that this line could be moving in good volume in another 30 days.

An exceptionally strong soybean meal market and higher animal protein market will cause some higher price lists. The affect of higher protein meals will be partially offset by the lower prices of the depressed millfeed market.

Northeast

The slightly improved demand for formula feeds held for the second week in a row. Consumers apparently have depleted their inventories and are now buying according to their needs.

Dairy feeds remained the backbone of the sales with most of the action still centered in concentrates. Egg mashes were well taken and chick and turkey starting feeds are continuing to improve.

Feed sales should hold up pretty well because end products are showing a profitable picture to growers.

Egg prices advanced 2¢ doz. Broilers edged over the 18¢ lb. mark in the East, an unusual level for this time of year.

The grain market, however, was at the mercy of political winds from Washington. The market weakened after earlier buoyancy because apprehension is growing that a corn price support program can't be passed in time to affect the 1961 crop.

Corn was down 2-2½¢ and oats off 2¢. Barley had a weak undertone and feed wheat held steady.

Vegetable proteins, however, held up well. Soybean oil meal (44% and 50%) advanced $3.50 and is likely to hold the gain. Gluten meal rose $2 and linseed oil meal just about held its own.

Millfeed prices slumped sharply on lack of demand.

Running time of formula feed manufacturers averaged 36 hours last week, unchanged from the previous period.

Southeast

Broiler feed business continues to be reported fairly good with mills' running time about normal. Chick replacements on the farm were up close to 1 million chicks over last week. Broiler prices advanced almost 1¢ per lb. as result of a shortage of birds for meeting processors demands, making the price 18 to 19¢ per lb. f.o.b. the farm. At the present levels growers are getting a fairly nice return for their broilers.

Cattle and hog feed business is showing signs of picking up after being on the slow side for several weeks. Fairly good demand for both soybean meal and cottonseed meal has caused the mills to advance their asking prices $1@2 per ton for future shipment. Immediate shipment of oil meals continue to be offered at $2@3 less. Cottonseed hulls are not moving as had been expected.

River traffic is now opened enabling barges to come into southeastern terminals causing asking prices for corn this week to drop as much as 5¢ bu. It has been reported by one milling company that within a 100 mile radius of his plant there is enough ear corn to make 40,000 tons of ground snap corn; this being in direct competition with citrus pulp, more processors have reduced their asking price for pulp. Citrus pulp production still exceeds demand.

Central States

Demand for formula feeds as a whole is holding on a fairly even keel. It's running a little behind last month but it's enough better than last February to make the mixers forget that it has eased off moderately from January. Prices dipped a little but apparently, this did not hurt the demand to any material extent.

Many are becoming increasingly

(Turn to **MARKETS**, page 115)

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BROILER PRICES GAIN

Broiler prices gained a healthy 1¢ lb. this week in the major production areas.

In the Southeast it was reported that the jump came because of a shortage of birds at processing plants. The farm price in the Southeast was in the 18-19¢ range.

At mid-week the top Delmarva farm price had reached 20¢ lb. The greatest volume of birds was moving in the 19-19½¢ range.

Market observers in Delmarva said the new marks were the highest since July. The price stayed in the 19¢ area for only three weeks last year.

Clears Hygromycin For Chicken Feed

WASHINGTON — The Food and Drug Administration has announced the issuance of a food additive order clearing the use of hygromycin B for use in chicken feed.

The order—issued following a petition by the Elanco Products Co., division of Eli Lilly & Co.—permits use of this antibiotic for use as an aid in the control of infestation of large roundworms, cecal worms and capillary worms in chickens.

It specifies a level of 4,000 units of hygromycin B per pound, equivalent to 8 grams of hygromycin B activity per ton. The finished medicated feed is not to be fed continuously for more than eight weeks. Labeling is to state that the medicated feed is not to be used for laying hens and that the feed must be withdrawn 48 hours prior to slaughter. A tolerance of zero is established for residues of the additive in or on eggs and the uncooked edible tissues and by-products.

FDA Gets Petitions On Coccidiostats

WASHINGTON — The Food and Drug Administration has received a series of food additive petitions dealing with use of coccidiostats.

The Feb. 10 Federal Register reported a petition by Dow Chemical Co. asking a regulation to provide for use of erythromycin thiocyanate in combination with Dow's zoalene in chicken feed. Dow also petitioned for use of oleandomycin in combination with zoalene.

Merck & Co. filed a petition proposing issuance of a regulation providing for use of the coccidiostat amprolium in turkey feed, with or without penicillin and Streptomycin.

Reported in the Feb. 11 Federal Register was a petition by Sterwin Chemicals Inc., proposing issuance of a food additive regulation for a combination of bithionol and methiotriazamine. This would provide for a new dosage form of the coccidiostat.

Anthelmintic for Dog Food Cleared

WASHINGTON — The Food and Drug Administration has issued a food additive order clearing the use of diethylcarbamazine as an anthelmintic in dog food. The action came on a petition filed by Corn Products Co., Waverly, N.Y.

The order clears use of the additive as an aid in control of large roundworms (ascarids) in dogs. The quantity permitted in the medicated dog food is 66 parts per million, or 30 mg. per pound. The food is not to be fed to dogs 18 months of age or older.

NAMED HATCHERY MANAGER

RUSSELLVILLE, ARK.—Kinslow Egg Co. announced the appointment of Bob Moellers as manager of its new hatchery here. Mr. Moellers formerly was flock service manager for Kinslow.

Dr. A. L. Andrews Heads Hess & Clark

ASHLAND, OHIO—Dr. Aaron L. Andrews has been named president and general manager of the Hess & Clark division of Richardson-Merrill, Inc., it was announced by Frank N. Getman, Richardson - Merrill executive vice president.

Dr. Andrews

Dr. Andrews started his career in general advertising, and later entered the University of California School of Veterinary Medicine at Davis, where he received a D.V.M. degree in 1952. Following experience in the commercial veterinary field, he joined Hess & Clark as advertising manager in 1955, becoming vice president and assistant general manager in June, 1960.

"Dr. Andrews' scientific training and his broad experience in advertising and marketing make him ideally suited for these new responsibilities," Mr. Getman said.

"Hess & Clark has experenced a significant expansion during the past five years and we are looking forward to a continuing growth under his leadership," Mr. Getman added.

Dr. Andrews is a member of the board of directors of the Animal Health Institute, an organization representing major companies in the feed medication and animal health field.

Hess & Clark manufactures and markets 50 different products and employs its own sales force which covers the entire U.S.

Cliff Weberg, Purina Plant Manager, Dies

MINNEAPOLIS — A. C. (Cliff) Weberg, 61, manager of the Ralston Purina Co.'s Minneapolis plant since 1944, died of a heart attack Feb. 16

Mr. Weberg, a native of Maynard, Minn., was widely known in feed circles for many years. He joined Ralston Purina as a production coordinator in 1927.

Mr. Weberg was a member of the Minneapolis Traffic Club, Northwest Feed Manufacturers Assn., and the Minneapolis Chamber of Commerce.

He is survived by his wife, Elsie; a daughter, Beverly Jean; and two brothers, Harry of Minneapolis and Selvin of Maynard.

Funeral arrangements have not been announced. The body is at the Werness funeral home in Minneapolis.

Tom Hartman Heads Superior Sales

HOPKINS, MINN.—T. E. (Tom) Hartman has been named sales manager for the Superior division of Daffin Corp., Hopkins, Minn., according to C. F. Pierson, president.

T. E. Hartman

Mr. Hartman previously held the position as manager of terminal sales for the Superior division which manufactures grain, feed and seed processing equipment. He will work out of the Daffin headquarters at Hopkins. Before joining the company, he was manager of the grain buying department of the Minneapolis Ralston Purina Co. plant.

Mr. Hartman attended Cornell University at Ithaca, N.Y., and is a graduate of Miami University at Oxford, Ohio.

H. A. (Hank) Pyzdrowski is general manager of the Superior division of Daffin.

ADA

(Continued from page 1)

Range Research Branch at the University of Nebraska, Lincoln, succeeds Dr. H. R. Bird, University of Wisconsin.

Three new directors were elected and two were reelected. New on the board are: W. A. Donnelly, National Alfalfa Dehydrating & Milling Co., Kansas City; Ralph Eickhof, Red River Alfalfa Co., Crookston, Minn., and Wallace Johnson, Springbank Dehydrators, Ltd., Chilliwack, B.C., Canada. Mr. Johnson is the first Canadian ever elected to serve on the ADA board. Reelected as directors were: E. A. Olson, Archer-Daniels-Midland Co., Minneapolis, and J. M. Schrum.

Outgoing directors included Ralph Beermann, Beermann Bros. Dehy, Dakota City, Neb., the newly-elected Republican congressman from Nebraska's third district. Mr. Beermann attended the convention and received congratulations and best wishes from the organization which he served as president in 1959.

Agriculture in the '60's

Dr. Tyrus R. Timm, head of the department of agricultural economics and sociology, Texas A&M College, gave the dehydrators his ideas on "American Agriculture in the Sixties."

"It is high time that we take the partisan politics out of agriculture. Neither the Republicans nor the Democrats have a monopoly on knowledge about how to solve farm problems," he said. "And we, as a people, must realize that the way we treat agriculture in the future may be a crucial point in the rate of total economic development in this country."

Dr. Timm predicted that agriculture trends established in the 1950's would likely continue through this decade. He gave these examples: Vertical integration will continue to grow; federal government roles in agricultural markets will continue; per capita consumption of frozen fruits and vegetables will grow; total agricultural production, which was up 25% in the 1950's, will likely rise 12-20% in the 1960's; less land will be used for agricultural production; and the total number of farms will continue to decrease.

More Integration

Commenting on vertical integration, Dr. Timm predicted that there would be more of this grouping of production, financing, marketing and other decisions under one head in the future, particularly for eggs, hogs and even field crops.

In the marketing field, Dr. Timm looks for most agricultural commodities to be produced and sold under private agreements or by federal marketing orders within 10 years.

"The revolution that is occurring at the retail level is more significant than the so-called farm revolution," Dr. Timm said. "Agriculture must produce the products that the food retailer wants, in the quantity he wants them.

"The consumer level may be a better guide post to determine production and marketing decisions in the future," Dr. Timm continued. "We have already found that pricing products at retail is often of minor importance in determining what the housewife buys."

Grading of farm products, especially meats, fruits and vegetables, may develop into a real controversy in the future, according to the Texas speaker. "There is a battle shaping up on government grading versus private grading," he said.

In summary, Dr. Timm noted that the unabated growth in commercialization of agriculture will bring many adjustments, but the agricultural industry will not become less important; it will continue to grow.

CAPITAL COMMENT

By John Cipperly
Feedstuffs Washington Correspondent

New Farm Policy

WASHINGTON — While the path of the new administration at the U.S. Department of Agriculture is unclear since its operators are persons generally gained from the cloistered halls of the academy, there are now foreseen some reasonably certain objectives behind the motions of the new hands at USDA.

The most obvious conclusion is that USDA is dominated by a group which proposes to set up USDA as a countervailing force between the farmer, the marketing machinery and the food processing industry.

It may be noted, too, that there are threats to the poultry, turkey and feed industries in possible moves which would result in controls over such operations.

The officials appear to be building a proposal that the USDA will act as an intervening force, perhaps euphemistically called a stabilizing factor which will provide a larger return for the farm production dollar than now goes to the marketing machinery and the processors.

"Stabilizing Influence"

To call the USDA indicated policies "countervailing" needs this definition. It is that USDA would be a price stabilizing influence since it would ultimately fix farm prices through price support levels and management of surpluses at USDA-controlled prices, with some voluntary acreage production levels on the part of producers for which they would be paid.

Since the farm production economy, the farm marketing machinery and the processing industries would find themselves frozen into a tight economy, it may be concluded that ultimately if the Cochrane theories of "supply-management" are to be effective, first we must embark on a Canadian Wheat Board type of grain marketing machinery and finally price controls on food.

It was the World War II experience that when price controls were active, it would be necessary to involve rationing of food supplies and the next essential step would be an overall control of all prices.

Economist Cochrane is not alone in his "supply-management" theory. He now, it is learned, has broad indirect support from Assistant Secretary of Agriculture James T. Ralph, former state secretary of agriculture of California.

Mr. Ralph is fascinated with the marketing order and agreement controls of the farm economy.

In some significant instances marketing orders and agreements have worked with eminent success, as for example in potatoes in recent years. In other areas, notably his home state of California, marketing orders and agreements, when aggressively prosecuted, have only worked to promote production of competitive supplies from outside that state. It is not now entirely certain that Mr. Ralph understands the background of the marketing order and agreement technique.

In the first place, if the Ralph theory is to be coordinated with that of the Minnesota economist, Mr. Cochrane and Mr. Ralph would have to use production controls in con-

(Turn to COMMENT, page 8)

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Beef Feeding Interest Grows

Reports on Cattle Nutrition Presented at Montana Event

By ROGER BERGLUND
Feedstuffs Managing Editor

BOZEMAN, MONT.—Beef feeding —stimulated by output of more than 50 million bushels of barley annually —is getting to be big business in Montana, as well as other barley areas. And much of the attention at the 1961 Montana Nutrition Conference was focused on developments in cattle nutrition, particularly the use of high-concentrate rations.

Montana may still not be one of the biggest feeding states, but interest in livestock feeding is growing tremendously in the area, and some 175 persons from the Northwest were on hand for the conference Feb. 6-7 at Montana State College.

The feed mean heard reports from Montana State and other scientists on such things as:

—Montana experiments with high-concentrate rations for fattening cattle.

—Fat, calcium and vitamin A in feedlot rations.

—The role of propionic acid as one of the newer developments in ruminant nutrition.

—Enzymes, kelp and dynafac for fattening cattle.

—The possibility of differences in feeding value among different varieties of barley.

The Montana conference was sponsored by Montana State in cooperation with the Montana Feed Manufacturers and Dealers Assn. and the American Feed Manufacturers Assn. Dr. O. O. Thomas of Montana State was chairman.

Summaries of some of the cattle feeding reports follow. (Other reports will be reviewed in a subsequent issue.)

FATTENING CATTLE ON HIGH-CONCENTRATE RATIONS IN MONTANA—There has been a tremendous increase in interest in cattle fattening in Montana and other barley areas in the Northwest. A recent estimate of the number of cattle on feed in Montana in 1960 indicated a gain of 52% over the same period a year earlier, and there have been additional increases.

Dr. O. O. Thomas, Montana State animal nutritionist, reported on several trials with high-concentrate rations, pointing out that such rations can be successfully fed to cattle.

Barley is the feed most available for fattening cattle in the area, and many feeders are reported to be using supplemented no-hay steam rolled barley rations.

However, Dr. Thomas noted that other feeds such as oats, wheat, wheat mixed feed, beet pulp and safflower meal can be fed with barley, if priced favorably.

At the outset, Dr. Thomas explained that a balanced daily ration for fattening 600-lb. yearling steers might include 13 lb. of barley and 2 lb. of a 20% protein supplement. This supplement would contain 2% calcium, 1% phosphorus and 5,000 units of vitamin A per pound. The total ration might be further improved, he said, by substitution of oats, wheat mixed feed or dried molasses beet pulp for part of the barley. He said 1 lb. of the 20% supplement with the above levels of calcium, phosphorus and vitamin A would satisfy requirements if the barley contains about 13% protein. The value of adding more protein to the ration than is necessary to meet requirements is not known, he indicated. Dr. Thomas commented that Montana researchers do not yet know if it is all right to use 1 lb. of supplement daily if the A and calcium levels are increased.

A supplement used with high-barley rations at the Montana station has included 40% of wheat mixed feed, 12.5% of dehydrated alfalfa, 12.5% of barley, 10% soybean meal, 10% cottonseed meal, 5% linseed meal, 4% limestone, 1% dicalcium phosphate and 1% premix. In experiments now being run, the 12.5% barley has been replaced by dehy to give a total of 25% dehy in the ration.

Dr. Thomas reported on one test in which heifers were gradually brought to a full-feed of steam-rolled barley and were fed 2 lb. of a 20% supplement which provided 2 gm. of dynafac in one lot. Hay feeding was gradually reduced and was discontinued at the 28th day. The heifers gained 100 lb. on about 650 lb. of feed. Average daily gain for the 126-day feeding period was about 3 lb., with a rate of 2.98 for the control lot and 3.04 for the dynafac lot. Eight animals graded choice and eight good.

In another trial, 32 yearling Hereford steers were used to study the effect of adding dynafac and Agrozyme in a high-concentrate ration. The steers were started on steam-rolled barley and 2 lb. of a 22% protein supplement and grass hay. Hay feeding was eliminated after the 18th day. The steers were hand fed, and barley was increased about 0.5 lb. per day until the steers were on full feed. The steers in the 179-day trial gained 100 lb. on 725 lb. of feed. Average daily gain was 2.75 lb. Steers fed dynafac or the enzyme product gained a little more efficiently, but the difference was not great in rate of gain. In previous tests with steers, use of both of these additives increased gain.

A test under way now is designed to determine the effect of amount of hay and also to compare steam-rolled with dry-rolled barley. Forty steers

(Turn to MONTANA, page 114)

E. E. Woolman | O. H. Cockrel | Victor Holt | Alex Gordeuk

Hales & Hunter Co. Announces New Executive Appointees

CHICAGO — Hales & Hunter Co., manufacturer of Red Comb-Pioneer Feeds, has announced the appointment of E. E. Woolman, executive vice president, to the newly created position of director of long range planning.

William Shaffer

Orvel H. Cockrel has been named to succeed him as director of marketing, according to William H. Garvey, Jr., president. The changes became effective Feb. 1.

In other moves, Victor F. Holt was named field sales manager and Alex Gordeuk, formerly head of the company's poultry feeds department, was promoted to marketing manager. Both will report to Mr. Cockrel. William Shaffer, formerly assistant to Mr. Gordeuk in the poultry feeds department, moves up to manager of that department.

In announcing the move creating a new long range planning department with Mr. Woolman as director, Mr. Garvey said, "The tremendous changes that have or will take place in the agricultural economy make it increasingly more important that we consider long range planning as being our most important consideration."

Mr. Cockrel joined Hales & Hunter Co. in 1958 as market research manager, was promoted to marketing manager a year later and served in that capacity until elevated to director of marketing Feb. 1. Previous to joining Hales & Hunter Co. he was research manager and later assistant to the president of Watt Publishing Co.

Alex Gordeuk, new marketing

(Turn to HALES & HUNTER, page 115)

Turkey Breeder Hens Up 27%

WASHINGTON — A 27% increase in the number of turkey breeder hens on farms Jan. 1 as compared with a year earlier has been reported by the U.S. Department of Agriculture.

Breeder hens Jan. 1 totaled 4,229,000 compared with 3,327,000 a year earlier, the report said. Heavy breed hens were estimated at 3,787,000 compared with 2,904,00 a year earlier. Light breed hens were estimated at 442,000, up 4%.

Compared to a year earlier testings for pullorum disease from July through December, 1960, were up 43% for heavy breeds and 4% for light breeds. Heavy white breeds, which accounted for 32% of all heavies tested July-December, were 80% above the corresponding period of 1959.

USDA said that in October, 1960, breeder flock owners in 15 of the most important states indicated their intentions to keep 26% more heavy breed hens than the previous year. Their intentions to keep light breed hens was for about the same number as in the 1960 hatching season. This compares with 30% more heavy breed hens and 4% more light breed hens on hand Jan. 1 than a year earlier. Growers, as of Jan. 1, indicated they intended to raise 20% more turkeys during 1961 than were raised during 1960. They planned an increase of 22% in heavy breeds and a 5% increase in light breeds. The number of breeder hens on hand Jan. 1 will be adequate to meet the intentions of growers to produce a larger turkey crop than was produced in 1960, the report continued.

Up in All Regions

The number of heavy breed hens Jan. 1 was above a year earlier in all regions of the country. Increases were 36% in the South Atlantic, 34% in the West, 33% in the West North Central, 27% in the East North Central, 25% in the South Central and 3% in the North Atlantic region. The 10 leading states, which account for 76% of all heavy breed hens in the nation, ranked in the order of importance are: California, Minnesota, Texas, Oregon, Iowa, Missouri, Ohio, Wisconsin, North Carolina and Virginia.

Number of light breed hens on farms Jan. 1 was 4% more than Jan. 1, 1960. Increases from a year earlier of 50% in the North Atlantic, 16% in the South Atlantic and 11% in the West North Central more than offset decreases of 15% in the West, 14% in the South Central and 5% in the East North Central states. The 10 leading states, with 89% of the light breed hens, are Virginia, Minnesota, Ohio, Texas, Iowa, Oregon, West Virginia, Missouri, California and Florida.

MONTANA CONFERENCE—Some of the program participants and association officers at the Montana Nutrition Conference at Montana State College in Bozeman, are pictured here. Left to right in the first photo are new officers and directors of the Montana Feed Manufacturers & Dealers Assn.—Harry Johnson, Montana Flour Mills, director; John Ross, Graham & Ross, director; Carl Butzer, Farmers Union Grain Terminal Assn., secretary, and Pat DeVoir, Occident Elevator, president.

In the second photo are some of the guest speakers—Dr. J. P. Bowland, University of Alberta; Dr. R. B. Grainger, Monsanto Chemical Co., and Dr. I. A. Dyer, Washington State University.

In the third picture are Dr. R. A. Rasmussen, Peter Hand Foundation; Dr. O. O. Thomas, Montana State College, and E. G. Horst, Calcium Carbonate Co.

ILLINOIS CONFERENCE—Vitamin A panel members at the Illinois Nutrition Conference are shown in the left photo with Dr. A. L. Neumann, left, moderator of the discussion. Dr. Neumann is head of the University of Illinois beef cattle division. With him, from the left, are: Dr. B. C. Johnson, University of Illinois animal biochemist; Dr. G. E. Mitchell, University of Kentucky livestock nutritionist; Dr. W. H. Pfander, University of Missouri livestock nutritionist, and G. S. Smith, University of Illinois nutritionist. Standing are J. T. Tollett and J. H. Sokolowski, University of Illinois graduate students. In the photo at the right, three University of Illinois speakers discuss their reports before presenting them. Left to right in the photo, the speakers and their topics are: Dr. A. H. Jensen, "Nutritional Considerations of 'Specific Pathogen-Free' Pigs"; K. E. Harshbarger, "Nutritional Considerations of Milk Replacers," and Dr. K. A. Kendall, "Calcium and Phosphorus Supplement for Dairy Cattle," all from the University of Illinois.

Illinois Nutrition Event Panel Delves Into Vitamin A Problem

By Special Correspondent

URBANA, ILL.—The puzzling vitamin A deficiency problem, its many facets and intricate angles, received a thorough hashing over at the University of Illinois Nutrition Conference.

A panel of nutritionists and biochemists delved into a deeper understanding of just how vitamin A functions in the body, a background of the deficiency problem and the possible role of dietary nitrates.

The panel summarized after two hours of reports and discussions—"Research so far has only scratched the surface in trying to explain this deficiency." Consequently the panel raised more questions about the problem than it gave answers.

Dr. A. L. Neumann, University of Illinois beef cattle researcher, moderated the panel. University of Illinois animal biochemist Dr. B. Connor Johnson gave a description of vitamin A's role in the animal body.

Dr. George Mitchell, University of Kentucky nutritionist, described how and when the problem first started attracting attention. Dr. Stan Smith, University of Illinois beef cattle nutritionist, explained the effects of high-nitrate silage on vitamin A.

Dr. W. H. Pfander, University of Missouri, discussed chronic nitrate toxicity.

Because of the time shortage, two Illinois graduate assistants, J. H. Sokolowski and J. T. Tollett, submitted their reports rather than presenting them orally.

High Nitrate Silages

In his talk on high nitrate silages, Dr. Smith said that the poor performance of cattle fed forages or silages heavily dosed with nitrogen fertilizers is becoming an increasingly important problem. He added that the problem appears to be related to factors favoring the accumulation of nitrates in plant forages: drouth, heat, excessive crowding and shading of plants and even water-logged soils.

Continuing, he explained that when animals eat such forages or silages, the nitrate is absorbed in the alimentary tract. There the nitrate is converted to nitrite and other compounds.

The nitrite acts as the real villain in nitrate poisoning, he said. It works as an oxidizing agent and prohibits the blood from transporting oxygen. This results in asphyxiation, so common in nitrate poisoning cases.

Then he explained that both vitamin A and carotene are susceptible to oxidative destruction. Therefore it's possible that the oxidative destruction of blood and tissue supplies of vitamin A and carotene is one of nitrite's toxic actions. Such an effect may be masked in acute cases of nitrite toxicity but becomes more obvious in more chronic cases.

He added that nitrite may also alter protein enzymes that are required to convert carotene to vitamin A. Or nitrite may also hinder the processes involved in the functional metabolism of vitamin A.

Then Dr. Smith raised these questions: "If rations of vitamin A-deficient animals contain adequate carotene, does this mean that the animal cannot utilize carotene?" "Are vitamin A and carotene destroyed in the animal, therefore increasing the animal's requirement for vitamin A?" "Or is it a combination of these factors?"

He cited several trials in which vitamin A-deficient animals have responded more satisfactorily to preformed vitamin A than to carotene. This perhaps indicates an impaired ability to utilize carotene, he stated.

Dr. Smith said that it is therefore reasonable to speculate that the difficulty involves destruction of carotene in the gastrointestinal tract of the animal, failure to absorb carotene or impaired ability to utilize carotene.

"Whether it relates directly to dietary nitrate or nitrite," he continued, "and what, if any other factors are involved is not known."

Dr. Smith also raised another question: "What, exactly, is the role of nitrate in vitamin A deficiency cases?" "If there is a distinct tie-up between vitamin A and dietary nitrate, are vitamin A-deficiency cases becoming more common because crops are receiving more nitrogen fertilizer?"

In an attempt to answer some of the questions, he said the University of Illinois is currently feeding four different corn silages to steers and sheep. The silage came from four different plots:

Plot 1 seeded at the high rate of 32,000 seedlings per acre, received a high nitrogen fertilizer. The thick seeding, Dr. Smith explained, increased shading to increase the accumulation of nitrate in the forage.

Plot 2 planted at a normal rate of 16,000 seedlings per acre, also received a high nitrogen fertilizer.

Plot 3, an average soil that received no additional nitrogen fertilizer, grew 32,000 seedlings per acre.

Plot 4, another average soil that received no additional nitrogen fertilizer, grew 16,000 seedlings per acre.

Analysis of silage from Plot 1 revealed that it contained 0.6% potassium nitrate, which is sufficiently high enough to cause problems in some cases.

Dr. Smith and his co-workers are feeding silage from all four plots to determine the nitrate's effect on vitamin A, to get information on the nutrients' digestibility and to determine the level of vitamin A in the blood plasma.

Effect of Nitrate

The report of one of the graduate assistants, J. T. Tollett, covered the effect of dietary nitrate on the growth and reproductive performance of hogs.

Mr. Tollett added levels of 0, 0.61, 1.23, 1.84, 2.4 and 3.17% nitrate, as potassium nitrate, to a corn-soybean meal ration. He found that levels above 1.84% significantly slowed gains. Further studies clarified that the nitrate, not the potassium, caused the slower gains.

In another study, Mr. Tollett added potassium nitrate and various levels of vitamin A to a milo diet. In all cases, regardless of vitamin A level, the rate and efficiency of gain were significantly depressed. Dietary nitrate also increased the methemoglobin level, and this response was not affected by vitamin A supplementation. In other words, the vitamin A did not prevent the toxic effects of nitrate in swine.

In another trial, Mr. Tollett used 24 gilts to study the effect of nitrate on early reproductive performance. Growth was again significantly slowed. But Mr. Tollett did not get any differences on corpora lutea number, percent of implantation, ovary weight, 25-day-old embryo weight, placental weight or thyroid weight.

Chronic Nitrate Toxicity

Dr. W. H. Pfander, from the University of Missouri, reported four sets of observations concerning chronic nitrate toxicity.

(1) Appetites of open cows on pasture, fed drouth corn and silage, were reduced within a week.

(2) Bred beef cows fed drouth corn silage containing 1.4% potassium nitrate became irritable and urinated excessively and four cows aborted. When the silage was removed, the cows recovered. A second group fed the same ration supplemented with

(Turn to ILLINOIS, page 109)

Murphy Planning to Export Concentrates

BURLINGTON, WIS. — Murphy Products Co. here has announced plans are being made for the export of its "Cut-Cost" line of livestock and poultry concentrate.

Dr. Robert R. Spitzer, Murphy's president and general manager, announced the appointment of Dumman World Trade Co., Milwaukee, as Murphy's International Division.

In the statement, Dr. Spitzer and spokesmen for Dumman indicated that arrangements were being made for world-wide distribution and that attractive franchises were still available in a few areas.

"We know that feed technology has improved rapidly in Europe, but the concentrate concept is relatively new to them and a natural for export purposes," Dr. Spitzer said. "We feel that our concentrate line is extremely well suited to helping get the maximum feeding value out of a limited grain supply and consequently help produce better quality meat, milk and eggs for a hungry world," Dr. Spitzer concluded.

Former Executive of Pacific Molasses Dies

PALO ALTO, CAL. — Harry M. Ferguson, one of the original executives of Pacific Molasses Co. and its vice president from the time of its founding in 1929, until the time of his retirement in September, 1947, died at his home in Palo Alto recently.

While active as an officer of Pacific Molasses Co., Mr. Ferguson was well known to the trade, both in the West and throughout the country. His activity in feed affairs dates back to 1923, when he was present at the founding meeting of the California Hay, Grain & Feed Dealers Assn. He is survived by his wife, a daughter, Mrs. Sydney M. Smith of Palo Alto; his son James M. Ferguson, president of Pacific Molasses Co. and eight grandchildren.

He spent his entire business career in the sugar and molasses industry. He started in the field of molasses distribution when he became manager of the molasses department of C & H Sugar Co. in 1922.

Sacked Differential Up

NEW YORK—An increase from $5 to $6 per ton in the sacked differential on corn gluten feed and meal has been announced by Corn Products Sales Co. The $1 per ton hike was effective Feb. 13.

Corn Products Sales said that the increase reflects the higher cost of bags.

POULTRY PRESIDENT

PORTLAND, ORE. — Pat Driscoll, manager Albers Milling Co., Portland, was reelected president of the Oregon Poultry Council at the group's annual meeting. Benson Mitchell, Jr., Beaverton egg producer, was elected vice president, succeeding Jim Howell, Swift & Co. H. R. Rohe, general manager, Oregon Egg Producers, was renamed secretary-treasurer.

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PRODUCTION

(Continued from page 1)

year for total production in this market since 1954.

The gain at Kansas City was in line with national trends, although perhaps exceeding the national rate of gain by a small degree, it was reported.

Improved feeding margins prevailed throughout the area during most of the year and this offset, to a major extent, the decline in numbers of hogs and chickens on farms in this area and probably was the major influence in sustaining volume. Turkey feed volume was up also during the year. Broiler feed demand was good, but this type of feeding is less of a factor in Kansas City production than it was some years ago when there were fewer mills nearer the heavy broiler areas.

Beef cattle numbers were higher in the area and this brought about some of the volume increase, but dairy cattle numbers continued to decline in line with the national trend.

With the growing percentage of Kansas City production in the form of concentrates for remixing, tonnage volume probably represents a larger over-all feed business out of this market than the figures themselves indicate.

There has been a big decline in Kansas City production from the postwar years of 1949-54, but a higher percentage of complete feeds was characteristic of that period and the current production may well be feeding as much livestock and poultry through remixing and satellite mills.

The following table shows production of feed by mills in Kansas City for a series of years:

1960.....	577,618	1954.....	635,128
1959.....	559,290	1953.....	659,154
1958.....	567,289	1952.....	762,979
1957.....	539,973	1951.....	759,103
1956.....	571,246	1950.....	632,715
1955.....	571,976	1949.....	580,383

PROPOSALS

(Continued from page 1)

duction. Producers in the new program would be ineligible for price supports unless they cooperated in the special agricultural conservation program.

What It Means

Well, let's see what all this fine language means in the market place.

General opinion says that the measure is broadly bearish on corn, particularly the December contract.

The level of support suggested for soybeans—which is not part of legislative changes but promised by the secretary of agriculture at $2.30 bu. and appears to be contingent on congressional approval of the feed grain provisions — has immediately evoked protests from the soybean industry as too high and out of line with the normal relationship between corn and bean meal.

Secretary Freeman threw some additional light on his position as set forth in a letter to the President at a press conference here this week.

The proposed bill openly requires cross compliance between all feed grains if price support is to be available for any one of them. Eligibility for price support will require a cutback in feed grain acreage by 20% from the base period of the 1959-60 crop years.

Cooperating producers of feed grains will earn a cash conservation payment equal to 60% of the gross value of a year's normal production on the diverted acreage. A cooperator in the feed grain program will be paid in kind to the extent that he decrease his base feed grain acreage beyond the required 20% at the rate of two thirds of his normal yield per acre, or he may obtain cash at his option. This further reduction compensation will be limited to an additional 20% of his feed grain acreage.

Soybean Acreage

The secretary says that to the extent that the feed grain acreage is reduced, he expects to obtain an additional acreage of about 2 million acres of soybeans. He explained at a press conference that only established bean acreage or land diverted from production will be eligible for price support for beans at the proposed new support rate of $2.30 bu. However, there is nothing in the language of the proposed bill or in his statement to the White House or in the President's letter of transmittal which reveals any such authority for use of diverted acreage to soybeans. Secretary Freeman is unclear on this point, although he says that the new program will divert feed grain acreage to soybeans.

Somewhat of a surprise to this reporter is the provision permitting Commodity Credit Corp. to sell its surplus stocks of commodities at the market price during the 1961 marketing year instead of the old provision which required CCC sales at not less than 105% of the price support level.

This should produce convulsions in the major commodity markets since the trade construes this to mean that with the new higher level of support at a national average of $1.20 bu., this appears to freeze the high side of the market at the support level, removing the elbow room for commodity market trading in the previous limited area of the sales price above the loan level.

President Kennedy's hopes for a March 1 enactment of the proposal are open to serious question. The soybean interests are openly dissatisfied with the broad advance in the soybean loan rate. The commodity market certainly cannot stand still for the proposed resale level.

Whereas former Secretary Benson is alleged to have gained the antagonism of the farmers, Secretary Freeman may be making a record of the current farmers' devil.

In his statement to the President he comments that the new soybean loan price will encourage diversion of part of the feed grain acreage to soybean production which he estimates will be as high as 2 million acres over last year's crop. He says in this connection that "the knowledge that CCC corn stocks will be placed on the market would encourage producers to participate in the program rather than gamble on market prices."

What Mr. Freeman appears to be saying is that USDA will sell corn—to compensate for the cost of paying farmers for redeeming certificates obtained for further reductions in corn acreage beyond the minimum of a basic 20% reduction from the base period.

It might appear to some observers that Mr. Freeman is holding a gun at the heads of the farm producers of feed grains, saying in effect, "If you don't comply, I have the power to break the price of feed grains." Ezra Benson was at least candid when he told the farmers that he wanted lower levels of support and wide open production and take your choice. Now the new secretary holds the loaded gun.

Bearish on Corn

It is this situation which congeals trade and market opinion around the belief that the corn-feed grain proposal is definitely bearish on new crop corn. Opinion is that the program, if enacted by Congress, will put a ceiling on corn, reflecting a national average price for corn not more than $1.20 bu., and as the acreage reduction program becomes effective, CCC will move into the market at the market price to sell more corn to regain the out of pocket loss it pays to farmers to redeem conservation certificates at cash.

However, an unexplained situation is: At what price will CCC redeem the certificates payable in cash — when it sells the grain or at the market price at the time the farmers ask redemption? It is seen that CCC will ultimately be selling corn in a steadily declining market, thereby pouring more supplies into the markets.

Would Support Poultry, Pork

At his press conference Mr. Freeman said that feed prices would rise in the deficit area of the East, but he said that he would step into the market to support the price of pork and poultry if prices dropped to disastrously low levels.

All of this makes a neat "put" for the corn-hog farmer who may be disposed, in Secretary Freeman terms, "to gamble on market prices." Hell's bells, the farmer is the biggest gambler in the U.S.

The Corn Belt farmer knows that few corn farms produce for price support protection. He also knows on the basis of past experience that there is always open market corn available at less than the support price. Opinion is that the corn-hog farmer will gamble. He will gamble that the open market price for corn will fall below the new proposed loan level, and since Mr. Freeman has stated he will support the price of pork and poultry, Mr. Corn-Hog farmer has no real risk. He may plant to his heart's content, knowing full well that if the government can maintain the price of cooperator corn at the national average level of $1.20 bu. and that USDA will not let the pork price slide to low levels, what can he lose?

Comment on Soybeans

Other trade comment is that the decision to support beans at a new higher level—the $2.30 bu. support for beans is seen as contingent on congressional approval on the feed grain proposal—means that there will be cheaper corn at the market place, soybean meal prices must be dedressed to reflect a lower corn price, and soyoil will have to tote the load for any higher soybean prices which now may be evident to the extent that the new proposal for higher loan levels will boost the price of new crop beans, or at least channel them off into the loan rather than the market place.

Soybeans, even if Mr. Freeman obtains his 2-million-acre increase for the next crop, are too sensitive to reflect less than the loan level.

The Freeman decision on beans also has another connotation which has not been fully examined.

It confirms the speculative market position that bean prices are too low on the basis of supply and demand. The announcement of a higher loan level for new crop beans effectively bails out the long positions on soybeans which have to date dominated the big Chicago market as far as old crop beans are concerned.

Soybean Meal

The real big bullish market news is confined to soyoil, which will have to carry the load of any higher soybean price support level. Soymeal will have to sell at relatively low prices if the corn loan produces low prices in the open market for corn —which is now generally conceded in informed market circles.

USDA — operating under instructions from the Food for Peace administrator, former South Dakota Congressman George McGovern, now on an educational trip to Latin America for a ten-day period—is working for huge overseas deals for U.S. surpluses.

President Kennedy and his USDA Secretary Freeman call for a big reduction in feed grain supplies; yet it is ascertained that Mr. McGovern would shovel into some Latin American nations huge stocks of feed grains to promote sizeable production of poultry, with additional stocks of U.S. feed grains as a backstop for his idealistic program.

Well, to re-quote this reporter's comment of several years ago—the Democrats spend money generously; the Republicans spend money reluctantly—but spend more money.

After Congress works over the Freeman feed grain bill, Mr. Kennedy may wish to revise his views on the farm problem. He has in the past, after he supported the American Farm Bureau proposals in a speech at Sprinfield, Mass.

COMMENT

(Continued from page 4)

nection with marketing orders and agreements.

Up to this time it has been the experience of old hands at USDA that production controls have no valid part in the marketing order-agreement machinery.

This workshop-level of criticism of the Cochrane-Ralph axis, supports congressional comment that the boys "talk from books and lack day to day common sense."

The suspected ideas of the newcomers at the throttle of USDA now indicate the worst that the marketing machinery has ever faced, and it also indicates that the administration policy regarding the farm problem is diverging at sharp angles without any common ground.

For example, while the Cochrane-Ralph axis seems determined to end all surpluses, the new Food for Peace administrator now appears to be giving orders to foreign agriculture service of USDA as to disposals of surplus supplies, or to procure supplies not in government stocks from the open market, to fulfill the vague Food-for-Peace concept which President John F. Kennedy has delegated to Food for Peace Administrator McGovern.

The McGovern-Orville Freeman relationship is somewhat reminiscent of the World War II days when then President Roosevelt inserted Marvin Jones as war food administrator with bold authority over the then Secretary of Agriculture Claude Wickard. At this time, FAS announcements emanate from USDA as Food for Peace announcement and not the prevous procurement authorizations issued by USDA for surplus stocks for foreign nations under Public Law 480.

Can this mean that the Kennedy Administration is preparing the down-and-out escalator for the Freeman-Cochrane team by spring time? It may be remembered that this reporter expressed the belief after his first meeting with the Benson Under-Secretary, True D. Morse, that he would not be in USDA more than six months. In fact, he stayed eight years. Alas.

For the feed, poultry and turkey industries, Mr. Ralph's idea of bringing the livestock, poultry and grain regulatory controls under the Commodity Stabilization Service—wherein the new CSS director may gain controls over marketing orders and agreements — is at best, a violent threat to those operators.

Mr. Ralph has, up to this time, gained no friends within USDA old timers as it is apparent that he intends to bring under his wing, as assistant secretary of stabilization, complete control over the marketing and supervisory and regulatory agencies of USDA.

It has been reported from West Coast sources that Mr. Ralph has missed the boat in this respect, and that he will not be able to consolidate the entire AMS regulatory activities within the Commodity Stabilization Service as it was known under Mr. Benson. In short, he will not make the CSS into a functional pattern as compared with a commodity control system as it has existed.

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Summaries of Beef Cattle Nutrition Papers Presented at Southern Ag Workers Conference

By Dr. T. W. Perry
Purdue University

EDITOR'S NOTE: Dr. Perry of Purdue's department of animal science, Lafayette, Ind., presents here summaries of selected papers concerning beef cattle nutrition heard at the Feb. 6-8 annual meeting of the Association of Southern Agricultural Workers in Jackson, Miss.

He reports that 1,300 persons registered for the conference, an indication that ASAW conference attendance is in an upward swing. Fifteen sections of the conference held meetings simultaneously and almost all facets of agriculture were covered, but more papers were presented on subjects related to beef production than to those concerned with swine, dairy cattle or sheep. This is the first of two articles summarizing nutrition papers. The second will appear next week.

The South and Southeast are literally "bustin' at the seams" in their rate of expansion in cow and calf herd production. This is not a new trend, but one that has been developing for several years.

Great emphasis is being placed on beef production in these southern areas which are among the last frontiers for fattening cattle for market. This growing interest was demonstrated at the Feb. 6-8 annual meeting of the Association of Southern Agricultural Workers at Jackson, Miss., source of the information included in the following summaries of beef cattle nutrition studies:

FEED ADDITIVES AND GROWTH STIMULANTS: Scientists are on the constant lookout for various types of additives which in themselves are not nutrients, but which do cause animals to gain more rapidly, require less feed to produce a pound of gain and which will not impair carcass quality. These products can be classed together under the terms feed additives and growth stimulants.

Newman, C. W., and J. Y. Oakes. Feedlot Response of Steers to Stilbestrol Implants Following Stilbestrol Implants on Pasture. Louisiana Station (Bossier City).

Steers in pasture were implanted with 24 mg. of stilbestrol (DES) and grazed pasture for the next 233 days. At the end of the pasture season, all of the steers were placed in the fattening lot and were implanted with 36 mg. of DES. The fattening period extended 140 days. The pasture gain for the implanted group was 195 lb. as compared to a gain of 159 lb. for the non-implanted group. However, this 36 lb. gain advantage in favor of implantation on pasture was erased in drylot where the once-implanted steers gained 34 lb. more than those which had been implanted both on pasture and in drylot (332 lb. gain vs. 298 lb. gain).

It is not presumed that these data are in conflict with those which indicate an advantage for implanting suckling calves which are destined for the feedlot. The cattle referred to in this paper were past weaning age. There appears to be quite an advantage for implanting suckling calves with 12 mg. DES unless the calves are to be saved for replacement stock. Such calves usually weigh 15-20 lb. more at weaning and even if DES is administered later in the feedlot, the calfhood implantation of DES apparently has no effect on feedlot response to DES.

Williams, L. W., and Bryan Baker, Jr. The Effects of Stilbestrol Implants on Reproduction and Market Qualities in Beef Heifers. Mississippi.

Heifers were implanted with 24 mg. of diethylstilbestrol approximately 175 days prior to the time they were exposed to a bull. In one year's study the heifers were hand mated over a 28 day period whereas in the second year the heifers were pasture mated over a 38-day period. The combined 2-year data showed 18 control and 22 treated heifers were pregnant at time of slaughter. Examination of the reproductive tracts revealed relatively few abnormalities in either the treated or untreated group. Average daily gains were slightly in favor of the implanted group.

These data would indicate there would be little impairment to the breeding program of heifers by the implantation of DES, as long as the elapse of time between implantation and breeding is in excess of six months. It is believed the effectiveness of an implant in cattle is probably gone by 150 days.

Ray, Maurice L., and William M. McBride. Effects of Synovex-S on Steer Gains and Carcass Values. Arkansas.

The results from two feeding trials in which Synovex-S was used in beef cattle feeding are reported. In each trial steers were implanted after the first 100 days of a 252-day feeding trial had progressed. In both trials the use of Synovex-S resulted in a significant increase in rate of gain (1.90 vs. 2.18 lb. per day; 1.76 vs. 1.92 lb. per day). In both trials there was no difference in cooler shrink, dressing per cent, carcass grade, color of fat or color of lean between treated and untreated groups.

Synovex-S is the trade name for an implant containing estradiol benzoate and progesterone. This is another example of hormonal effect on rate of gain of beef animals. Apparently there is quite an array of hormones and hormone-related products which have an affect on rate of gain of beef cattle.

Chapman, H. L., Jr., and C. E. Haines. Value of Reserpine in Steer

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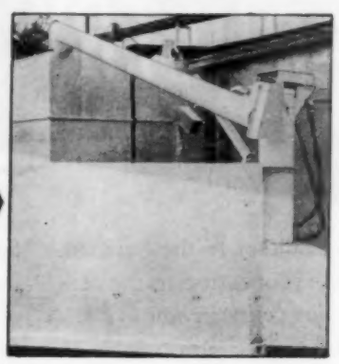

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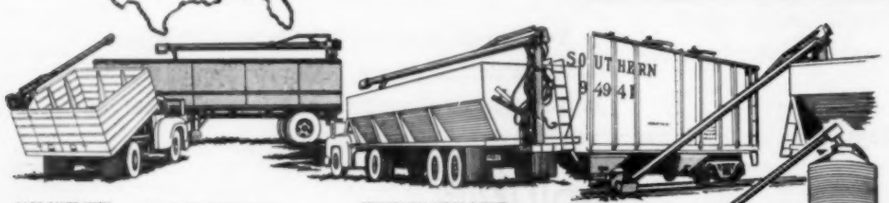

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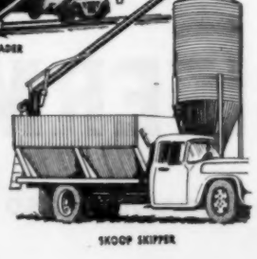

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Fattening Rations. Florida Everglades Station.

The tranquilizer reserpine was fed in two experiments with Brahman-Angus crossbred steers. In the first of the two pasture fattening experiments levels of either 0.5 or 1.0 mg. of reserpine per head daily resulted in increases in rate of gain (2.10 lb. vs. 2.22 and 2.28 lb. per day) whereas levels of 2.0 or 4.0 mg. per day did not result in an increase in rate of gain. In the second pasture fattening experiment, levels of 0.25 mg. and 0.50 mg. reserpine resulted in increased gain of the magnitude of 8 and 13%.

The group of additives under the category of tranquilizers sometimes looks promising while at other times there appears to be little future in the beef cattle nutrition picture for tranquilizers. There is no clear cut guide as to why beneficial effects are obtained from feeding tranquilizers sometimes and then there is no advantage at other times.

Haines, C. E., and H. L. Chapman, Jr. A Comparison of Three Antibiotics for Weanling Calves. Florida.

The value of Aureomycin, Terramycin and oleandomycin for weanling calves on pasture was compared in two trials. A level of 75 mg. per head daily of the respective antibiotics was fed in the treated lots. In addition to the pasture, weaned calves were fed 4 lb. of concentrate mixture per head, daily. No consistent benefit was obtained in either year from the feeding of the three antibiotics compared. However, it should be pointed out that the best gaining lot of both experiments gained less than an average of 1 lb. per head daily. Undoubtedly the balance of the ration—including the pasture— was reflected in poor over-all gains.

PELLETING AND OTHER PROCESSING OF FEEDS:

Alexander, R. A., J. H. Hentges, Jr., and J. T. McCall. Nutritive Value of Long, Ground and Pelleted Coastal Bermuda Grass Hay with Data on Rumen Epithelium and Volatile Fatty Acids. Florida.

First calf heifers fed ground hay (¼ in. screen) consumed more hay per day than heifers fed their hay in the long form, but there was no difference in weight change. Detailed analyses were made on the rumens and rumen contents of these two groups of heifers. Except for a slightly higher pH (6.7 vs. 6.2) and less rumen contents (13.8 liters vs. 18.4 liters) rumen from heifers fed ground hay were not too different from those fed long hay.

In a digestion trial, the relative availability of nutrients was compared for long, ground and pelleted hay. Crude fiber digestibility was lower in the ground and pelleted hays, but nitrogen-free-extract digestibility was higher.

When one processes hay by grinding or pelleting, apparently changes

(Turn to page 14)

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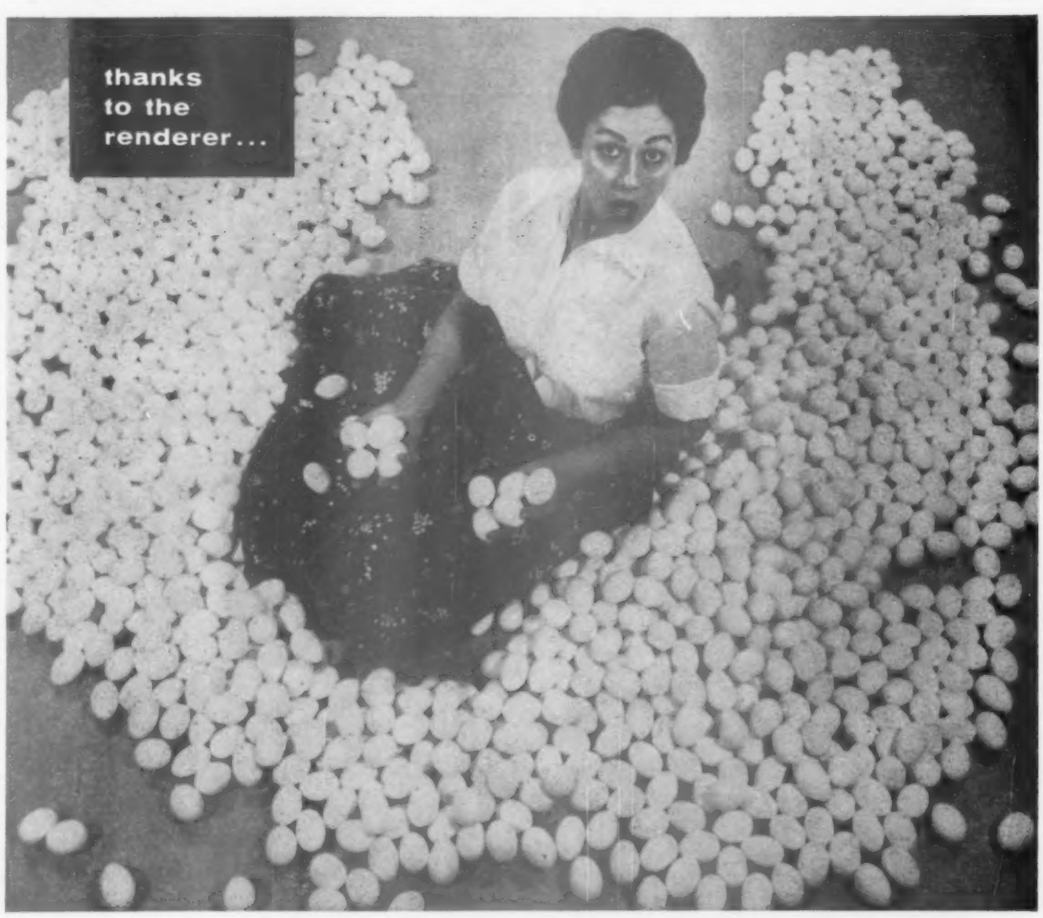

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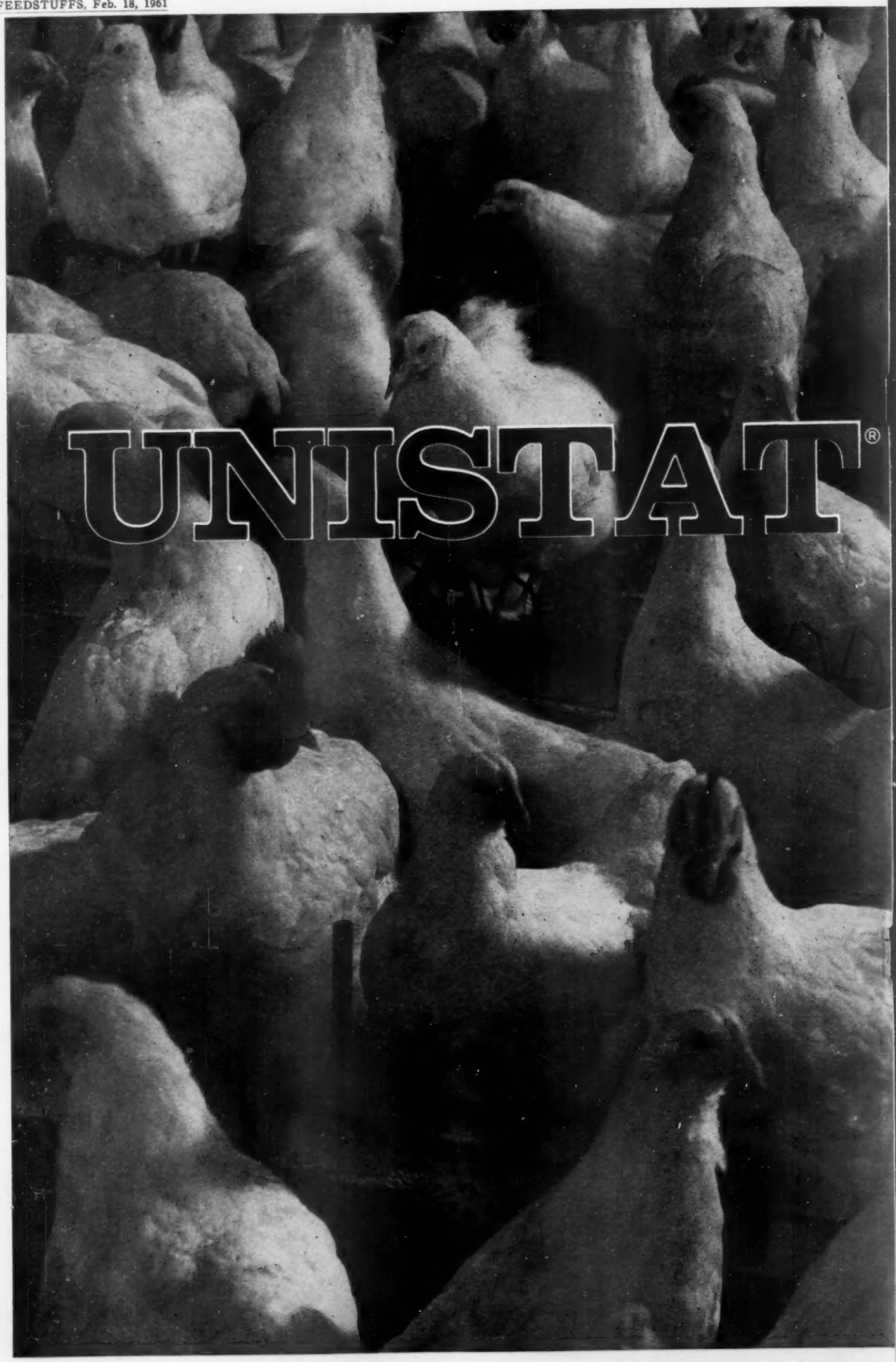
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SPEAKERS—Pictured here are three of the speakers appearing on the program of the Feb. 19-21 convention of the Midwest Feed Manufacturers Assn. in Kansas City. Fred Darragh of the Darragh Co., Little Rock, Midwest president, will open the speaking program with introductory remarks on the convention slogan, "Have Food—Must Sell." W. E. (Ed) Glennon, president, American Feed Manufacturers Assn., will moderate a "Meet the Feed Press" panel which will take part in a discussion of a previous talk on "Making Feed at the Point of Use." Maurice Johnson, formerly executive vice president of Professional Feeds and now vice president of First National Bank, Kansas City, will talk on "Feed Financing Is Growing Up."

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are brought about in the manner in which ruminants use their hay. The reasons for these apparent changes in utilization are not known.

Baird, D. M., M. C. Campbell and O. E. Sell. The Feeding Value of Coastal Bermuda Pellets, Cooked or Flaked Corn and Ground-Snap-Corn in Stocker Rations and as Supplemental Feeds for Cattle on Winter Pasture. Georgia.

In a drylot stocker type of ration, calves fed a full feed of ground-snap-corn and 1 lb. of cottonseed meal gained practically the same as calves fed Coastal Bermuda grass pellets and cottonseed meal (1.17 lb. vs. 1.20 lb. per day).

In another phase of the research, cooked corn, flaked corn and shelled corn were compared for growing calves. The three lots of cattle used to compare the three methods of feeding corn grew at a comparable rate. The feeding of Coastal Bermuda pellets to calves on pasture was of no apparent benefit but the feeding of slightly in excess of 4 lb. corn per day increased the rate of gain of cattle on pasture significantly.

Arnett, D. W., and N. W. Bradley. Effects of Pelleted, Flaked and Ground Corn and of Pelleted Distillers Dried Grains with Solubles on Digestibility of Fattening Rations and Feedlot Performance of Beef Steers. Kentucky.

Several combinations of feeding ground corn and distillers dried grains with solubles (DDG/S) as pelleted or unpelleted were tested. The pelleting of both corn and DDG/S or the feeding of flaked corn with pelleted DDG/S resulted in 11% and 13% increases in rates of gain when compared to the ration in which neither was pelleted (2.31 and 2.35 lb. per day vs. 2.09 lb. per day). However, analysis of the data indicated these differences were not statistically significant.

In digestion studies pelleting of the corn resulted in lowered digestibility of crude fiber and increased digestibility of the nitrogen.

Once again, the research scientist is at a loss to describe what the process of pelleting does to certain feedstuffs in changing the manner in which livestock utilize it.

MISCELLANEOUS:

Kuhlman, L. R., R. D. Furr, and A. B. Nelson. Creep Feeds and Creep Feeding Calves Until Spring vs. Weaning. Oklahoma.

A comprehensive set of data was presented which indicated some of the advantages and disadvantages of various plans of creep feeding beef calves.

The four-year average increase in gain due to creep feeding fall beef calves, from mature beef cows, from two months of age to weaning at 8½ months of age was 70 lb. per head, and the average feed consumption was 878 lb. per animal. This figures to be about 12 lb. of feed for each extra pound of gain.

When young cows were not fed very well during the winter, the feeding of 944 lb. of feed per calf resulted in an extra gain of 98 lb. or about 10 lb. feed per extra 1 lb. gain. When this same amount of feed was provided to the under-fed mothers, their suckled calves gained only 60 lb. more. Therefore, extra feed can better be fed to the calf rather than to the mother, under such conditions.

The creep feeding of 309 lb. of alfalfa hay resulted in 38 lb. less winter gain than creep feeding 378 lb. of concentrate mixture. There was no advantage in pelleting the creep concentrate mixture or in pelleting the alfalfa hay for the calves.

Temple, R. S., and G. L. Robertson. The Effect of Creep Feeding on Growth Rate, Grade and Economy of Production of Crossbred Calves in the Gulf Coast Region. Louisiana.

Calves were either weaned at 150 days of age and full fed for the next 84 days, or, left with their dams on Bermuda and Dallis grass and creep fed from 150 days of age to 234 days of age, or, left with their dams on pasture with no creep ration available.

One year's results showed a 35-lb. advantage in the 84-day period in favor of creep feeding over non-creep fed calves and a 39-lb. advantage over early weaned calves. However, in the second year's research, non-creep fed calves gained more than those creep-fed or those weaned early.

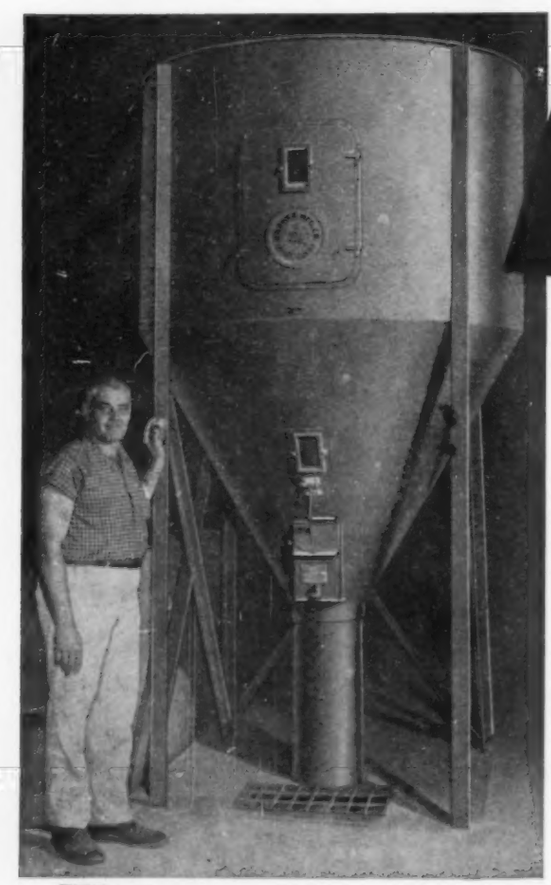
These data suggest that the benefits of creep feeding are largely dependent upon environmental conditions. In other words, if the pasture is luxuriant enough to encourage maximum milk flow of the dam, probably there is little advantage to creep feeding calves on pasture.

Anthony, W. B., R. R. Harris, V. L. Brown and J. G. Starting. Influence of Winter Feeding on Milk Production of Wet Beef Cows. Auburn.

In one comparative test, wet beef cows were winter fed coastal hay plus 2 lb. of cottonseed meal whereas another group was pastured on small grain-clover and fed hay and CSM. Calves running with their dams in the two groups gained 1.16 and 1.50 lb. per day, respectively. There is something about growing pasture for quality and quantity of milk produced which is extremely difficult to reproduce when harvested feeds are fed.

In a second trial, one lot of nursing cows received coastal hay plus 2 lb. of CSM per day; a second group pastured a vetch-clover-rye sward established on coastal sward, and a third group of cows were fed coastal hay and CSM, but their calves had access to oats and clover grazing. The calves from the cows on the coastal-CSM ration in drylot gained 1.3 lb. per day. The calves which had access to oats and clover pasture, but whose mothers were on coastal-CSM ration in drylot gained more rapidly—1.61 lb. per day. However, the best gaining calves were those in which both the cows and calves had access to winter pasture—1.92 lb. per day.

Apparently the calves received a boost in gain by being able to pasture themselves, but received a greater boost when their dams were pastured



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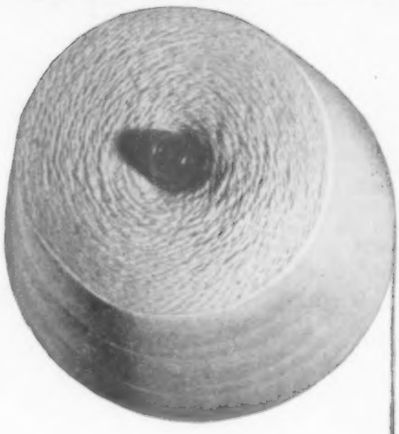

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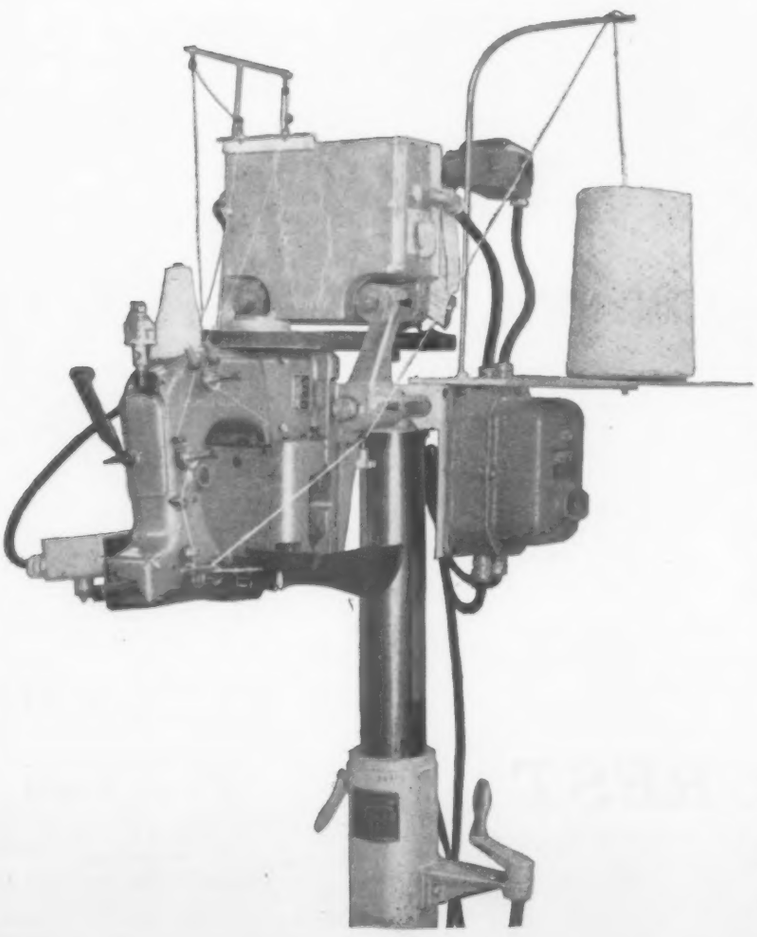

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Jones, B. M., Jr., N. W. Bradley and R. B. Grainger. The Effect of Fat and Urea on Fattening Rations for Beef Steers. Kentucky.

The additions of fat and urea, alone and in combination, to a fattening ration of corn, cobs, molasses and soybean meal were studied.

The addition of either fat or urea had no significant effect on the rate of gain (basal, 2.14; urea, 2.04; fat, 2.10 lb. per day). However, the addition of both fat and urea depressed rate of gain (1.64 lb. per day). Furthermore, the digestibility of crude protein and TDN were depressed in the rations containing both fat and urea.

In a second trial, the addition of calcium or lysine was not effective in counteracting the depression on rate of gain of cattle fed fat and urea in combination. Either fat or urea fed alone as additions to the basal ration did not have the growth depressing effect of the combination.

Malphrus, L. D., R. L. Edwards, D. H. Kropf and Mrs. S. A. Marbut. Effects of Feeding Concentrates to Steers Fattening on Coastal Bermuda. Clemson.

Three years of research designed to show the value of Coastal Bermuda in summer cattle fattening programs were summarized. Well fertilized pastures were stocked with from 3 to 4 yearling steers per acre. The steers were group-fed a full feed of a mixture of 5 parts ground shelled corn, 3 parts ground oats and 1 part cottonseed meal.

In comparing pasture performance vs. drylot-fed steers, pasture steers gained slightly less (1.80 vs. 1.94 lb. per day); required 23% less concentrate per lb. gain, and produced carcasses which did not grade quite as high as those from the drylot-fed steers. An average of 976.5 lb. of gain per acre was attributed to the pasture.

Kirk, W. G., F. M. Peacock, E. M. Hodges and J. E. McCaleb. Pangolagrass Hay and Silage in Steer Fattening Rations. Florida Range Station.

Two years' research were designed to compare the feeding value of the roughage Pangolagrass, when it was harvested and stored by two different methods—as hay or as silage. The two were fed with a protein supplement plus citrus pulp and citrus molasses. The respective roughages made up 25% of the rations. There was no significant difference in the quality of the roughages when measured in terms of rate of gain of the cattle.

It is interesting to note that the two methods of harvesting and storing the roughages resulted in almost similar feeding value. However, in certain areas of the country silage might well be superior to hay made from the same crop because of the difficulty in making good hay.

Ammerman, C. B., L. R. Arrington, J. T. McCall, J. E. Wing and G. K. Davis Nutritive Value of Dried Citrus Pulp for Steers. Florida.

Lime added in the preparation of dried citrus pulp yields calcium values that sometimes exceed 2%. With a phosphorus content of approximately 0.15%, this presents a calcium to phosphorus ratio in excess of 13:1. A digestibility trial was conducted to determine the effect of the high Ca:P ratio on digestibility of the nutrients in citrus pulp. The ration consisted of 70% dried pulp, 27% Coastal Bermuda hay and 3% cottonseed meal. Apparent digestion coefficients of protein and energy were in the range of 53% and 67%, respectively, in the citrus pulp.

Hendrickson, R. F., L. S. Pope, R. L. Hendrickson and George Waller. Effect of High vs. Moderate Planes of Nutrition on Feedlot Performance and Carcass Characteristics of Steer Calves. Oklahoma.

Three groups of Hereford steers were fed to gain as rapidly as possible for 350 lb.; fed to gain moderately for the same time as the first group, or fed to gain moderately, but to gain a total of 350 lb. Moderates slaughtered at the same time as the rapidly gaining calves were the lowest grading calves, with less yield, less internal and external fat, less marbling, and more lean than the other groups. The moderate group fed to gain 350 lb. total gain was intermediate to other treatments in most characteristics.

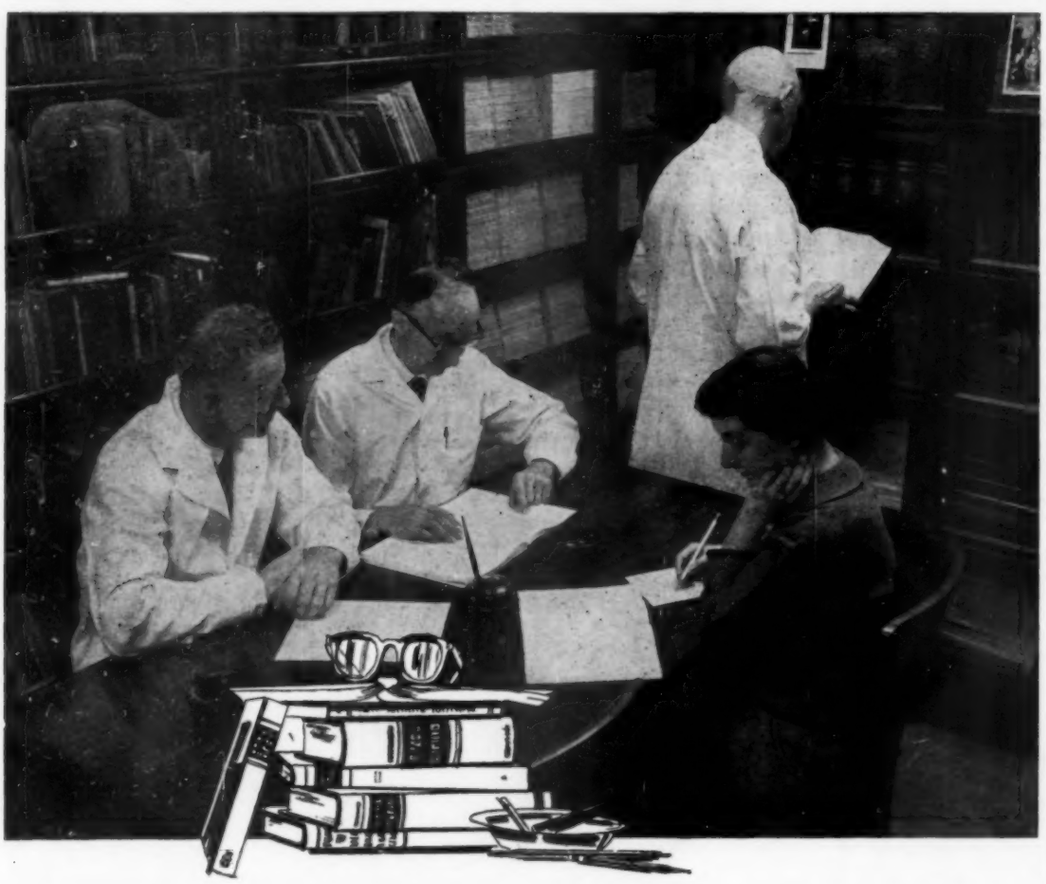
The word "fat" is still quite polite and in order when describing high quality beef animals. We have found no substitute for fat to make beef tender, juicy and tasty. Admittedly, it has been found we don't need as much fat as we once thought, but at least a fair amount is required to make good "lip-smackin' " steaks..

Hot Spot to Open North Carolina Office

DES MOINES — Hot Spot Detector, Inc., of Des Moines, has announced that it is opening a new area office in Raleigh, N.C.

A subsidiary of Neptune Meter Co., Hot Spot manufactures and distributes aeration and temperature measurement systems for protecting grain from damage by mold, insects or moisture.

Bruno Sestini, who has been at the Des Moines office for seven years, will be in charge of the new southeastern office. He will service the 200 existing Hot Spot installations in the area and sell and install new temperature and aeration systems along the eastern seaboard, it was reported.



MOST IMPORTANT INGREDIENTS IN LIME CREST TRACE-MINERAL PRE-MIXES

. . . **Knowledge** — information gained from research conducted all over the world. Into the Lime Crest Research Laboratory's library come more than 80 periodicals, mostly technical, in the fields of animal and poultry science, nutrition, biochemistry, analytical chemistry and veterinary science. Some of the files cover a period of almost 35 years. This constantly-growing library is one of the best of its kind — if not the best — in the feed industry. It enables the staff of the Lime Crest Research Laboratory to keep informed of the latest developments in the field of animal nutrition — to be familiar with what has been learned in the past as well as with what is being discovered today . . . and **Experience** — Lime Crest's experience gained in making trace-mineral pre-mixes for a period of almost 25 years.

This knowledge and experience is your assurance that Lime Crest Trace-Mineral Pre-Mixes are formulated in accordance with the best information available. If you are not already using a Lime Crest Trace-Mineral Pre-Mix*, write or call us for more information . . . at least, let us send you our latest folder and price list.

**If you want a special pre-mix, we can satisfy your requirements . . . send us your specifications for a prompt quotation.*

Lime Crest

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Farmers Union GTA Tells Feed Sales

ST. PAUL—Feed sales of Farmers Union Grain Terminal Assn., St. Paul based cooperative, totaled $7.1 million for the 1959-60 year, according to a report by Tony Roffers, feed manager.

Mr. Roffers said that two new feed plants and an assured supply from Northwest Co-op Mills, St. Paul, will move the cooperative's feed department into high gear.

Nearing completion is a new plant at Ellis, S.D., with a capacity of 200-250 tons of feed per shift. It is equipped with 70 bins—24 for bulk feed ingredients, six for bulk premix ingredients, six for bulk finished feed premix products, eight packing bins and 16 bulk finished feed holding bins.

There are also grain and pellet bins and liquid tanks at the facility.

Equipment consists of two hammermills, two mixers, two pellet mills, two automatic packers, two fork lift units and a 20 by 200 ft. warehouse.

The facility is being constructed to allow for a 50% expansion of production, Mr. Roffers commented. The automated plant employs 12 persons.

A smaller mill has been completed at Edgeley, N.D. That plant has 38 bins—14 bulk ingredient bins for mixing, six bulk ingredient holding bins, 12 bulk finished feed holding bins, two pellet bins and four packing bins.

The Edgeley mill is equipped with one hammermill, one pellet mill, one mixer, one automatic packer and one fork lift. The warehouse is 40 by 150 ft.

"Transportation is one of the major problems that management faces in any feed operation, so these mills are designed to serve specific areas," Mr. Roffers noted.

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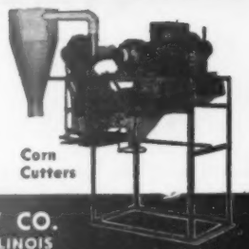

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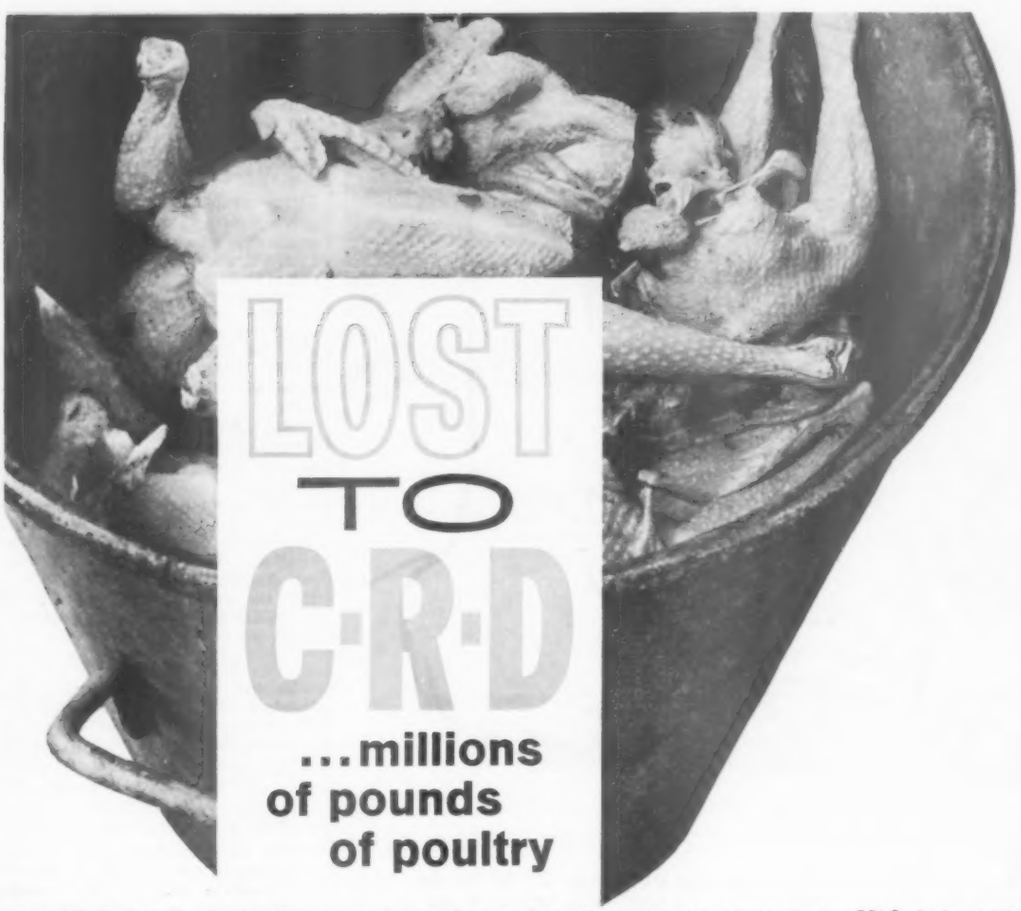

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Independent experimenters report "excellent response"! Controlled studies involving thousands of birds were carried out in different parts of the country. In these tests, response to GALLIMYCIN Injectable was rated as "very good" to "excellent". In one study, injected birds averaged .56 pounds heavier than control birds . . . mortality was less than one-half of one percent.

The cost to you is less than one-half cent for each one-pound bird. Try it! GALLIMYCIN Injectable, ready to use, is supplied in 250-cc. bottles by your Abbott distributor. That's enough for 2,500 birds.

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Putting Research To Work

BY SPENCER H. MORRISON, PH.D., D. V. M.

Utilization of Field-Chopped, Dehydrated, Pelleted Alfalfa by Milking Cows

● H. R. Conrad and J. W. Hibbs, Ohio Agricultural Experiment Station Research Circ. 91, October, 1960.

ABSTRACT

Two experiments were conducted with small groups of cows to investigate the feeding of pelleted third and fourth cutting alfalfa hay which had been field-chopped and then pelleted directly through a ¾ in. die in comparison with green chopped alfalfa (third cutting) or with a corn silage-alfalfa hay ration. In the first experiment the chief object was to obtain preliminary information on the feeding value of such pellets, relative to the production and fat tests, etc., obtained previously when the same cows were fed freshly cut (two times daily) alfalfa. During the first two weeks after shifting over to the pellets as the sole roughage it was noticed that the intake was highly variable between individual cows and that the cows commenced to eat considerable amounts of wood shavings being used as bedding. One aged cow, five years of age, refused to eat more than 5 lb. daily of the pellets, and was replaced in the trial with a younger animal. It was observed that when 3-5 lb. of clover mixed hay was fed daily, the trouble ceased.

Therefore, during the last six weeks of the trial, Jerseys received 3 lb. and Holsteins 4 lb. of this hay along with free choice pellets. The grain intakes of the cows were maintained at approximately 25% of the total roughage intake. This approximated the previous rate of grain feeding used when the cows were on the freshly cut alfalfa. The six week milk production figures demonstrated no significantly different levels when adjusted for normal lactation decline to those previously obtained for the same cows when fed fresh cut alfalfa. However, it is interesting to note that the cows declined in butterfat test when being changed over to the pellets. It took them about 6-8 weeks to apparently adjust to the new feeding regime and for fat test to climb back to previous levels.

Digestion Trials

Digestion trials and nitrogen balances were carried out on these cows during the eighth week of the pellet feeding and were compared with results previously obtained during the last period of fresh cut alfalfa feeding with the cows. From a nutritional standpoint, digestibility was reduced, cellulose digestibility dropped to 41.3% compared to 67.5% for the green alfalfa ration. Dry matter digestibility was reduced from 71.2% to 60.6% and protein digestibility declined from 76.1% to 65.0%. This was compensated at least partially by the fact that the cows consumed appreciably more daily feed and, as a result, the average daily digested dry matter intake was essentially the same with the pellets and green alfalfa.

Two of the cows were shifted to alfalfa pellets alone after six weeks for digestion trial comparisons with those fed the pellets along with 3 lb. of mixed-clover hay. In this case no differences were observed in milk production, butterfat percentage, roughage intake or per cent dry matter digested. This indicated further that the cows were able to adapt to the pellet feeding after approximately six weeks of feeding.

Second Experiment

In the second experiment, four Holstein cows approaching the end of the first month of lactation were gradually shifted to fourth cutting alfalfa pellets fed free choice along with 4-8 lb. of clover-timothy hay daily. Grain was fed at approximately 25% of the total roughage intake during the eight week trial. A similar group of control cows, of equivalent producing ability, was fed second cutting alfalfa hay and corn silage supplemented with a maximum of 14 lb. of grain per head per day. Average daily milk production of the two groups was quite similar. Four digestion trials carried out with two other cows showed that the dry matter digestibility of the total ration including alfalfa pellets, hay and grain was 66.6%, compared with 67.8% for the corn silage, hay and grain ration.

No significant changes were observed in the type of rumen flora maintained in the rumens of the cows previous to and after initiating pellet feeding in these experiments. This finding suggests that the possible reduction in cellulose digestibility stemmed more from too rapid passage from the rumen, rather than from a

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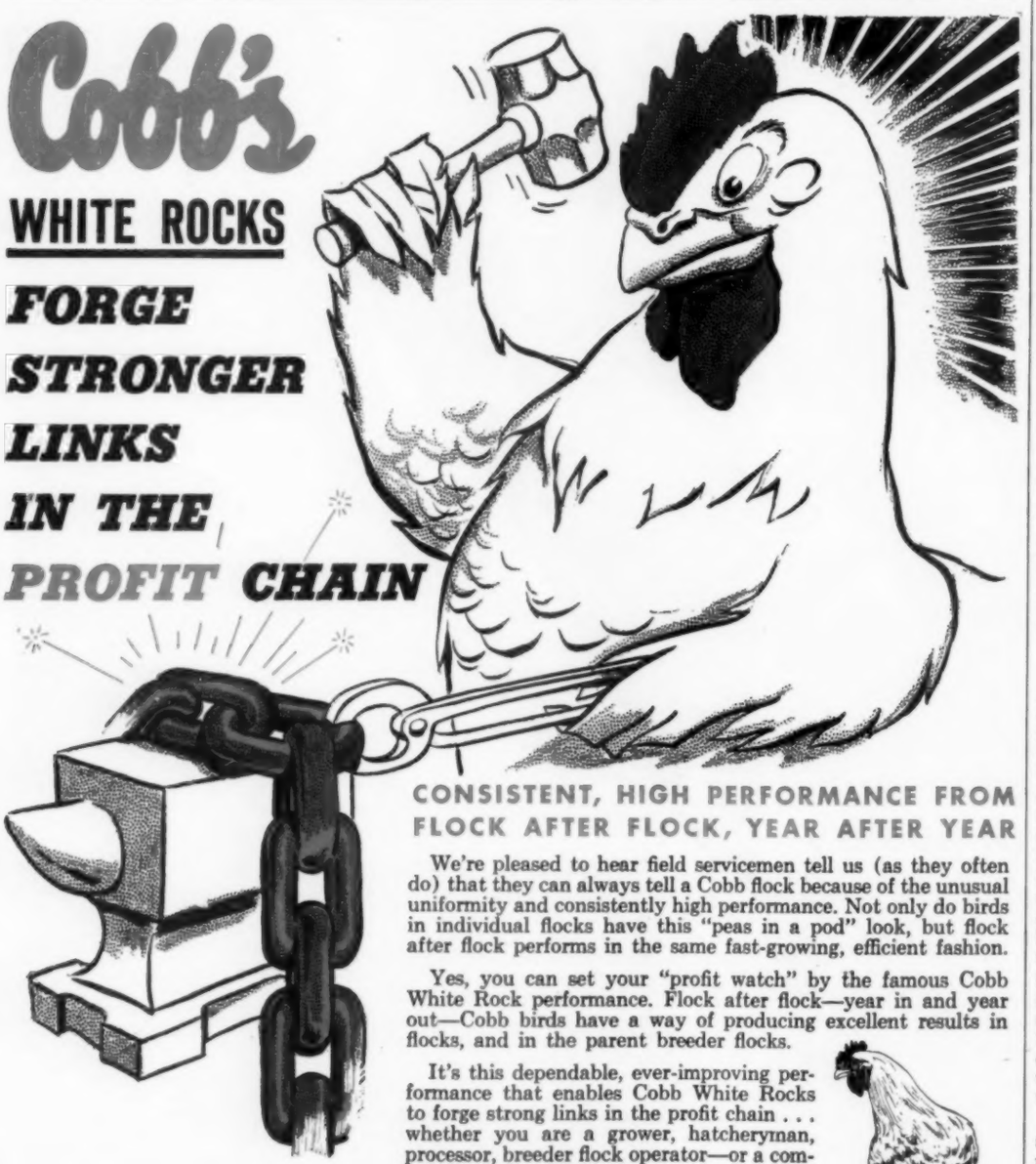

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shift in the type of fermentation in the rumen.

COMMENT

Interest still persists in pelleting of roughages and in an all pelleted hay-concentrate ration for dairy cattle. This is probably because of the fact that considerable success has been had with such rations in beef cattle and sheep feeding. The results with dairy cattle have often shown that butter fat test is liable to be reduced accompanied by a decrease in cellulose digestibility when all-pelleted roughage is fed, especially if the roughage has been ground before pelleting. The Ohio work seems to indicate that even field-chopping before pelleting produces much the same deleterious effects as grinding. Work at several stations has shown that hay pellets or wafers made from uncut or coarse hay may give fully as good results with milking cows as long hay (Bringe et al., 1958; Jones et al., 1958; Addis, 1959). A recent report from Idaho (1960) comparing alfalfa wafers and baled hay showed that even hayfers may not be desirable, if the hay is chopped before compression, since fat test was reduced 0.26% on the average.

Indications of Results

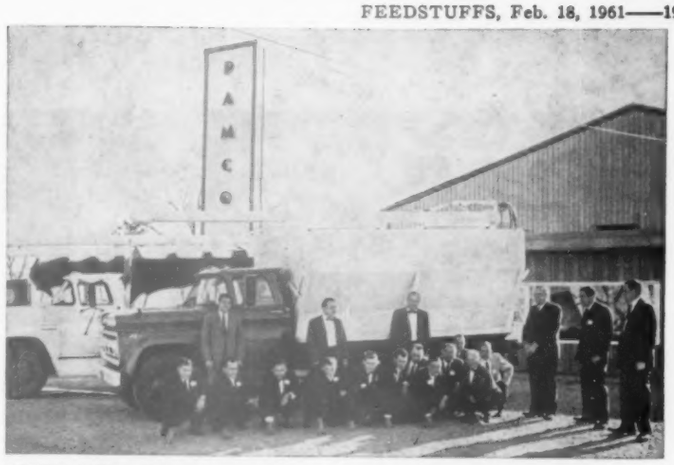
With dairy calves, much like beef animals, no appreciable effects are noted from pelleting which can be considered to be deleterious. But results also indicate that calves will not gain faster on pellets or roughage in comparison with long hay, unless the roughage fed is of unusually poor quality.

Using timothy hay and corn silage as the roughage for milking cows, the Michigan workers (1959, 1960) have reported that supplementary feeding of dehydrated alfalfa pellets (up to 3 lb. per head daily) definitely improved production, mostly as a result of increased persistency.

Contrary to most of the published results with pelleted roughage for milking cows are reports from the University of California (Ronning, 1960) using cows of modest productive capacity. Cows fed no concentrate and on an all pelleted alfalfa hay produced more milk than similar cows fed chopped hay as the sole diet. Also, pelleted hay alone was fully equal to rations of pelleted hay plus concentrates or chopped hay plus concentrates and without a consequent decline in butterfat test. Further experiments at the same station showed that the concentrate level used in all pelleted diets was extremely important in influencing the depression of fat test. At concentrate levels of approximately 30% or more in all pelleted diet, fat test depression set in even though milk production was improved at the 30% concentrate level in comparison with a 15% concentrate level. This work would seem to indicate that one must consider the level of concentrates used, when feeding all-pelleted diets or when using all-pelleted roughages. Work at this station, and at others, indicates also that the disadvantages of pellets as the sole roughage source can be overcome when some long hay is fed along with them.

Potential Economy

Pellets would seem to offer potential economy in dairy feeding because of compact storage and mechanized handling. Field wafering machines are rapidly approaching practical usage as developmental pilot models change into production line machines. Dairymen in congested dry lot-feeding areas would seem to have a particularly big stake in this development.



SALES MEETING—Pamco, Inc., sales representatives met recently at the home office in Oskaloosa, Iowa for a three day sales meeting. Featured was the introduction of the new Pamco front unloading and loading bulk delivery truck named "Big Daddy." Photo shows Pamco sales representatives in front of bulk delivery truck and management officials at right, including H. S. (Pete) Palmer, president of Pamco.

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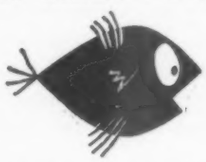

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Blood Spots and Vitamin A
Research Studies Show Rapid Recovery With Levels Above 2,000 USP Units Per Pound

● Experiments with white leghorn chickens show that blood spot incidence in eggs increases as the level of vitamin A falls below 1100 USP units per pound of feed. In the range of 1200 to 1600 units per pound minimum blood spot incidence is noted, but birds which have been depleted of vitamin A reserve show fastest reduction in percent blood spots when fed diets containing at least 3600 units of vitamin A per pound. National Research Council requirement of 2000 USP units of vitamin A per pound of feed appears to be satisfactory but to reduce the incidence of blood spots in birds depleted of vitamin A, levels above this requirement give best results.

Therapeutic Use of Vitamin A
Requirement Set At 10,000 USP Units Per Pound of Ration

● A recent report stresses the need for critical evaluation of the vitamin A level in poultry feed. Clinical evidence of vitamin A deficiency is often not seen until the condition is well advanced. This makes it vital that adequate quantities of readily available vitamin A be included in the rations. The report indicates that 2,000 USP units per pound of ration for laying birds represents the standard requirement level but that 10,000 USP units per pound of ration for young or old birds has been arbitrarily set as the therapeutic requirement. Water dispersible forms of vitamin A appear to have some advantage for therapeutic work because of their ready availability. SVI's Perma-Sol is our recommendation where this need for water dispersibility is evident.

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"Your Hog Products Headquarters idea is terrific!" says Lloyd Buis & Sons, R. #2, Cloverdale, Ind. "The catalog mailing that you made direct to my customers brought real results. From what I hear, your 1961 program is even more powerful. Keep up the good work—it's working and selling hog products for me."

"When you said that *all* your advertising would have my name on it, you really meant it," says Dan Jones of Valco Feed Products Co., Inc., Metropolis, Ill. "It's the best 'grass roots' campaign I've ever seen since I've been in the feed business. I'm selling more hog products than ever before."

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Study Shows Most Egg Council Members Independent; Sources of Feed Vary

KANSAS CITY—A survey by the National Egg Council of its members has found that 96.4% of them own their own laying flocks outright and decide how and where their eggs will be marketed. They are also independent in their preferences as to source of feed. Purchases of feed directly from the manufacturer lead.

The figures show that 32.1% of the members buy their feed directly from the manufacturer and 20.8% buy from dealers. Another 20.8% rely on cooperative mills and 22.7% mix feed right on their own premises, the survey showed. Approximately 3.4% build their rations from the ground up.

Bulk feed ranks high with NEC members with 65% of them using this type of feed for all or a portion of their requirements. The survey found that western producers lean most heavily on bulk feed while sacked feed predominates in the eastern part of the country.

The marketing portion of the survey found that 36% of the producer members of the fledgling organization covering 44 states use the wholesale route exclusively to market their eggs. Many sell all or a portion of their eggs directly to retail stores, reported the council whose average member owns over 6,000 laying birds.

Changes Ahead

About one out of seven of the members said they were not satisfied with present feeding methods and plan changes. Most of these changes—61%—represented switches to bulk feeding. About 20% each are thinking of installing their own mixing equipment or building a ration from the ground up.

Equipment Used

Automatic watering appears to have reached universal acceptance among poultrymen with over 95% using such equipment. Next most popular mechanical device is an egg cleaning unit with 61.6% of the farms having them. Mechanical egg sizers showed up on 50% of the farms.

Mechanical feeders were reported in use on 40.7% of the farms, with the highest percentage in the Midwest and the lowest in the East. Only 10% of the farms employed mechanical litter-removing devices and just 4% had automatic egg cartoning equipment. Mechanical egg gathering units are employed on 3.3% of the farms.

The 28-question survey brought a 75% response from NEC members, according to Carroll Eiler, Warsaw, Ind., producer and president of the two-year-old organization. First vice president is Mrs. Wesley Taylor who, with her husband, operates an egg farm on the outskirts of Kansas City. William McKay, Vista, Cal., egg producer, is second vice president. Executive offices are located at 521 East 63rd St., Kansas City.

Purpose of the survey was to determine how best the new organization could serve its membership, Mr. Eiler commented.

"The survey proves that the people most interested in a national organization of this type are producers who not only spend a great deal of their time supervising the production and marketing of eggs but own the actual farm production units," declared Don Turnbull, assistant secretary.

Survey Data

Following are data gleaned from the survey:

(1) A total of 96.4% of the members of NEC report ownership of their laying flocks and decide for themselves where and how their eggs are to be marketed. Percent of ownership is greatest in the West, with the Midwest second, South third and East fourth. However, the margin of difference is small; 89.5% of the eastern members own their birds outright.

(2) Members rely on various feed sources. A total of 32.1% go direct to manufacturers, while 20.8% buy from feed dealers. Another 20.8% purchase from cooperative feed mills and 22.7% mix their own feeds on the farm. Only 3.4% build their own rations from the ground up.

(3) Bulk feed has achieved substantial status, with 65% reporting bulk installations. A larger percentage obtain their feed via bulk in the West than in any other area, with the East leaning more heavily on sacked supplies.

About one out of seven members said they were not satisfied with present feed methods and plan to make changes. Most of these—61%—said the change involved a switch to bulk. Another 20% said they would install their own mixing plants and a similar proportion said they may build their rations from the ground up.

(4) Automatic watering devices have reached almost universal status, with over 95% of the members using such systems. Next most popular among the mechanical labor-saving units were egg cleaners with 61.6% of the farms reporting this equipment. About 50% have mechanical egg-sizing machines. Mechanical feeders are in use on 40.7% of the farms, with the highest percentage in the Midwest and the lowest in the East. Only 10.9% of the members use mechanical devices to remove litter; 4% have automatic egg cartoning equipment and 3.3% have mechanical egg gathering systems.

(5) Members were asked what percentage of the eggs produced on their farms were sold directly to retail

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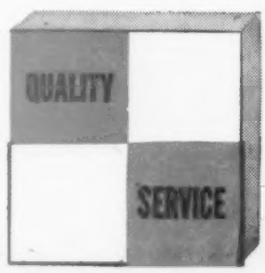

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FLORIDA EGG ROYALTY—Miss Sandra Kay Hooker (center) was crowned Miss Florida Egg of 1961 at the Florida Poultry Producers Assn. winter meeting. Her court included, from left to right, Ginger Alexander, Barbara Garrett, Glenda Ruth Gilson, Vernelle Toole and Carolyn Sue Harms.

stores. Almost one half said they sold no eggs directly to stores. On the other hand, 29.6% said that from 30 to 100% of their entire volume was sold direct to retail stores and another 18.7% said from 5 to 25% of their volume was marketed thusly. The South and West led among the regions selling direct to retail stores. Midwest producers were last.

(6) Producers were asked whether they cartoned the eggs sold from the farm. Approximately one half carton a portion or all of their eggs.

Of those selling direct to retailers, 45.6% deliver directly to the stores and half of these place the eggs directly into the showcase.

(7) In answer to the question of whether eggs sold directly to the stores carried the producer's own brand name, 71% said "yes."

Of the total membership buying egg cartons, over 39% ordered some with brand names imprinted thereon.

(8) Most NEC producers continue to rely on wholesalers to find market outlets, 36% counting on this route to dispose of all their eggs. Another 11.8% count on this market to absorb 30 to 70% of their eggs. Few NEC members depend on auctions. Those who did were located primarily in the East. About 27% sell some or all of their eggs via cooperatives. Most of these were in the Midwest and West.

(9) It was interesting to note that 8% of the members, while owning their flocks and farms, also served as assemblers and wholesalers.

(10) About 52% of the members sell some eggs directly to household buyers, but only 7.6% relied on this market for as much as 75% of their total volume.

(11) Apparently NEC members are overlooking one market outlet because less than 1% counted on restaurants, hotels, hospitals, schools and other institutional users as a main market. Only 3.4% sold from 30 to 70% of their eggs to these customers.

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F. H. Peavey & Co. Opens Oregon Branch

MINNEAPOLIS — Opening of a grain division in Portland, Ore., was announced by F. H. Corrigan, vice president of terminal merchandising for F. H. Peavey & Co., pioneer grain and milling firm.

Gerald E. Tucker, formerly with Balfour Guthrie & Co., Ltd., Portland, was named manager of the new office.

This operation is one of several recent expansion activities of the Peavey company, according to Mr. Corrigan.

"The office will support the company's export operations, assist in sales of the Occident elevator division in Montana, and general merchandising of grain in the Pacific Northwest," he said.

GRAND OPENING

SCOBEY, MONT. — A grand opening and tour of plant facilities, offices and operations was held at the Nash Bros. Feed & Grain Co. in Scobey recently. The extensive modernization program, in progress at that site for more than a year, now includes modern equipment for pelleting, steam-rolling, hay-chopping and pelleting, vastly expanded storage facilities and groves of automatic switches.

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JOE BROOKS

BY AL P. NELSON

Let the Customers Hear Your Voice

When Jim Bates came in from the barn that snowy February morning for his mid-morning cup of coffee, his plump wife Hannah said, "Jim, what do you suppose our friend Joe Brooks has done now?"

Chunky Bates sat down at the kitchen table and sniffed the warm coffee appreciatively. "Well, I wouldn't know," he said. "Joe could do a lot of things. But I'll bet I know one thing he didn't do."

"What would that be?" asked his wife, placing a plate of coffee cake before him.

"He didn't run off with another woman!"

Mrs. Bates stamped her foot. "Now, Jim Bates, why do you always say such crazy things?"

Jim sipped his coffee, then chuckled. "Oh, maybe because I like to get a rise out of you. Makes life more interestin,' doesn't it?"

Mrs. Bates bit her lips in vexation. "I do declare, I just never get to know you and I been married to you 12 years. You have the craziest streak in you sometimes."

"That's what my dad used to tell me when he walloped me with his shoe," Jim observed. "It's just something I'm stuck with, I guess. And so are you. What's this Joe Brooks has done?"

His wife stood looking out the window. "Maybe I won't tell you," she said. "You're too ornery."

"Aw, shucks, I didn't mean it, Hannah," Jim said. "Man, I sure did marry a good cook. This coffee cake is always about twice as good as any I've ever eaten anywhere else."

Hannah turned from the window, a smile on her face. "Want some currant jelly on it, Jim?"

"No, thanks. It's good the way it is. I don't want to mix the taste."

Mrs. Bates walked across the room, came back with a flat package in her hand. "Jim, Joe Brooks sent us a record. It came in the mail a little while ago."

"A record!" exclaimed Jim, his coffee cup halfway from the table to his mouth. "He'd better stick to sellin' feed, and stay out of the record business. What does the record say?"

"I don't know. I haven't played it." Mrs. Bates handed her husband an envelope, about 6 x 6 in. The envelope copy said, "A Personal Message from Joe Brooks." It was marked first class mail, fragile, don't bend.

"Holy cow!" ejaculated Jim, slowly pulling out a round, plastic type record. "I wonder if Joe's sending us some rock 'n' roll."

"I hope not," Hannah said. "I hate that stuff, but I like polkas and old time waltzes."

"Well," said Jim, "let's put it on the record player and hear it."

Mrs. Bates looked shocked. "Jim! In the middle of the day? How about our work schedule?"

Jim waved his hand deprecatingly. "Oh, I wanna hear it now. Otherwise I'll be thinking about the darn thing all day, wondering what it is and why Joe sent it to us."

"I want to hear it, too," Hannah said, "but I didn't want to admit it to you."

She brought in a small record player from the living room and placed it on the kitchen table. Then she placed the small record on it.

As the needle touched the plastic record, there came the strains of a rapid polka, and immediately Jim's feet began to tap. "Ma, how about a polka?" he grinned.

"During the working day?" His wife was shocked.

Then the polka music stopped and they heard Joe Brooks talking:

"Hello, friends, this is Joe Brooks, your feed dealer. I'm coming to visit each of you one of these days, but right now I've sent you this record to help you get ready for the big spring season.

"It's not too late to order baby chicks and equipment. Just phone us your order now and be ready to take care of the chicks when they arrive.

"We've got lots of analyses of dry fertilizer on hand, if you are short. It comes in bulk or bags. And we've got liquid fertilizer, too. Don't wait until the last minute and get caught in the rush.

"How about field and garden seeds? We can supply you with just about any kind and amount you want. Phone us now."

Joe then went on to tell customers how happy he was to serve them and that he was ready to answer any

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seed, feed or fertilizer problem they might have. He listed the many and different services his mill and store could perform. And he invited them all to come and talk with him over a cup of coffee.

The record ended with another burst of fast polka music, whereupon Jim Bates got quickly to his feet, grabbed his portly wife and polkaed around the kitchen. "Jim! Jim!" cried his wife, struggling to get away. "What'll the neighbors say if one should come and see us dancing in the daytime?"

"To heck with the neighbors. I don't like that record, and I'm going to tell Joe Brooks so."

His wife looked surprised. "Why not?"

"There isn't enough polka music on it, that's why," protested Jim. "I was just gettin' in the mood, and it stops."

"But we need chicks and fertilizer, Jim. We've been stalling the last couple of weeks."

Jim sighed. "Yeah, I suppose so. Well, you phone Joe Brooks now and order your chicks and stuff. That's your department. When I come in this noon, I'll phone him and book fertilizer. He has my soil test."

At the door he stopped. "Save that record," he said. "I like that polka music."

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Studies on an Interrelationship Among Sulfur Amino Acids, Arginine, Selenium and Vitamin E in Muscular Dystrophy in the Chick

By Dr. M. L. Scott
Cornell University

Earlier studies on muscular dystrophy conducted in this laboratory indicated the existence of an interrelationship in the metabolism of vitamin E, sulfur amino acids and selenium in the prevention of muscular dystrophy in chicks. The interrelationship did not appear to be directly involved with the synthesis of creatine or the function of methionine as a methyl donor. Indications were that the beneficial effect of methionine in the prevention of muscular dystrophy may be due to its function as a source of sulfhydryl groups via cystine. It was considered possible that selenium may play a role in sulfhydryl metabolism, such as sulfhydryl oxidation or transfer, or in one or more enzyme systems containing sulfhydryl compounds.

It was shown in chicks fed a purified diet containing casein as the principal source of protein that when the diet was deficient in arginine, sulfur amino acids and vitamin E, no muscular dystrophy occurred in the chicks up to seven weeks of age. When this diet was supplemented with 1, 2, or 4% arginine monohydrochloride, severe muscular dystrophy occurred in 100% of the chicks by the time they were 4 weeks of age. The levels of 2% and 4% arginine did not increase the incidence or severity of muscular dystrophy over that obtained with 1% added arginine. When chicks were fed the basal arginine-deficient diet to 5 weeks of age and one half of these chicks then received the basal diet supplemented with 1% arginine, all of the chicks receiving the arginine supplement showed muscular dystrophy within the next 2 weeks (by the time they were 7 weeks of age), whereas none of the chicks receiving the arginine-deficient diet developed symptoms of dystrophy. When the basal containing arginine was supplemented with either methionine, cystine or vitamin E, muscular dystrophy was prevented. These results, therefore, indicate the existence of a very important interrelationship among the sulfur amino acids, arginine and vitamin E in the production of muscular dystrophy.

Four experiments have been conducted using a vitamin E-deficient basal purified diet containing only approximately one half the chick's requirement of methionine and approximately one-fifth the required level of cystine. When this diet was fed alone, muscular dystrophy occurred in 90-100% of the chicks within 5 weeks. Addition of 0.19% DL-methionine caused a marked improvement in growth but no improvement in the incidence nor severity of muscular dystrophy. On the other hand, the addition of an equisulfur amount of cystine (0.15%) completely prevented muscular dystrophy without increasing growth. The same results were obtained when the experiment was repeated. When the growth of the chicks receiving added methionine was approximately equilibrated to that of the chicks receiving cystine, by feeding both lots equal amounts of feed, the cystine addition at 0.15% prevented muscular dystrophy while the equisulfur level of added methionine (0.19%) did not. Further experiments are in progress comparing the effects of L-methionine with those of DL-methionine at these critical levels. No results of these studies are available yet.

Further experimentation with this diet showed that the addition of alpha-tocopheryl acetate to the basal low-methionine, low-cystine diet prevented dystrophy completely, but resulted, at the same time, in a marked decrease in the growth of the chicks.

A working hypothesis based upon the results presented above, is as follows: (1) Cystine is essential for prevention of muscular dystrophy; (2) arginine addition to the diet of chicks causes a demand for methionine in certain metabolic reactions which reduces the amount of methionine available for conversion to cystine; and (3) when dietary methionine is below the level needed for use in the body as methionine per se, little or no cystine is formed from this methionine unless the diet contains vitamin E. Studies with radioactive methionine have been conducted to attempt to prove or disprove this hypothesis stated above. All three parts of the hypothesis are being investigated. Thus far, no conclusive results have been obtained.

This work has been accompanied by other studies on phosphorus metabolism in dystrophic vs. non-dystrophic chicks. Phosphorus distribution, rate of uptake in blood, liver and muscle and disappearance in blood have been studied. Total phosphorus and specific activity of the phosphorus in muscles of chicks were found to be much higher than in normal chicks. Upon fractionation of the phosphorus in muscle, it was found that the inorganic phosphorus fraction was increased most markedly in dystrophic chicks. Evidence was obtained indicating poorer phosphorylation or more rapid turnover of the phosphorus of creatine and ATP in dystrophic as compared to normal chicks.

The further evidence presented here indicating the involvement of vitamin E in the metabolism of such important compounds as the sulfhydryl-containing enzymes, ATP and phosphocreatine further marks vitamin E as an important key to a better understanding of many metabolic functions, especially those involved in prevention of muscular dystrophy.

EDITOR'S NOTE: *Dr. M. L. Scott, poultry scientist at Cornell University at Ithaca, N.Y., currently is speaking and studying in Europe. This article is from a paper presented by Dr. Scott before the Swiss Section of the World's Poultry Science Assn. in Zurich.*

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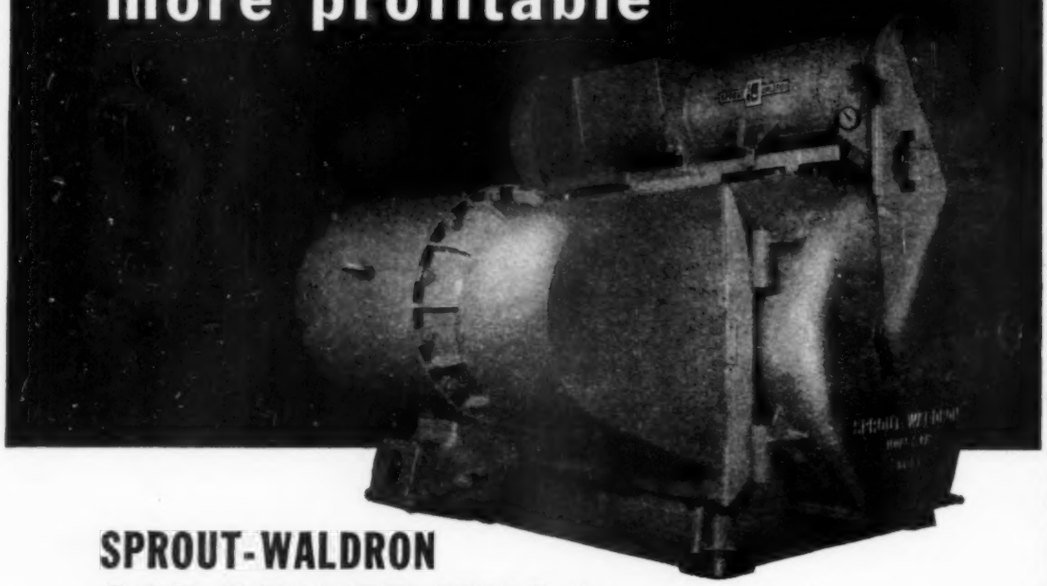

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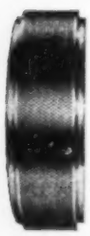

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Penn State System Cuts Egg Labor Cost To 3.2c Per Dozen

UNIVERSITY PARK, PA.—Wage rates have nearly doubled in the past nine years, but during this time the Pennsylvania State University's mechanized solar poultry house has cut labor costs per dozen eggs from 7¢ to 3.2¢.

Dr. Glenn O. Bressler, in charge of poultry housing research for the Pennsylvania Agricultural Experiment Station, says a saving of one minute of labor per dozen eggs pays for all mechanical equipment when amortized over five years.

In 1959-60 experiments, labor in the mechanized solar poultry house came to only 1.65 minutes per dozen eggs. In 1951, labor in the average floor-type laying house took 7 minutes for the same chores, including egg cleaning, grading and packing.

The Penn State solar poultry house is equipped with mechanical feeders and waterers, a mechanical egg collector, pit cleaners, and thermostatically controlled fan ventilation.

Dr. Bressler says, "Greatest benefits from mechanized egg collection will come with direct cleaning and grading, to eliminate handling of most eggs. The process is already used on some farms. It shows promise of reducing labor costs below the 1.65 minutes per dozen eggs, as shown in our Penn State experiments.

"With today's laying hen producing more than 20 doz. eggs annually, the depreciation cost for equipment would be less than 2¢ per dozen."

In figuring costs, $2 was used as the initial cost of equipment per layer for a flock of about 2,800 layers.

A major problem with mechanized equipment, he says, is lack of sufficient volume of eggs per given floor area to pay for the equipment. To solve this, Penn State successfully houses layers at 1 sq. ft. of floor space per hen instead of the usual 3 sq. ft.

With 1 sq. ft. of floor space per hen, Penn State has achieved annual records of 260 eggs per layer, a feed conservation of 4.1 lb. per dozen eggs, and about 10% mortality.

Joins Pacific Molasses

SAN FRANCISCO — The appointment of Robert Pretzer, Chowchilla, Cal., as a field representative for the Central San Joaquin Valley area, has been announced by the Pacific Molasses Co., San Francisco, Cal., nationwide marketer of feeding molasses.

Mr. Pretzer will work with Winslow Hall, western sales manager at San Francisco, in the over-all development of nutrition and feeding techniques for dairy, livestock, sheep, hogs and poultry.

Meat Board Produces Movie for Theaters

CHICAGO—The National Live Stock & Meat Board has unveiled its newest vehicle for consumer education and meat promotion: a full color motion picture which will be shown in metropolitan and neighborhood motion picture theaters throughout the nation.

The board reports that the 15 minute movie, starring Hans Conreid, television, motion picture and radio performer, was premiered at the annual convention of the American National Cattlemens Assn. in Salt Lake City, Utah.

Titled "The Adventures of Dudley Worthington," the movie is an extension of the board's continuing program of reaching more people with more information on meat. While the board's previous nine motion pictures were made for 16 mm. projection for use in classrooms, on television and before special audiences, the newest movie is a 35 mm. production and was made specifically for use in motion picture theaters as a short feature. It is being scheduled at theaters by a commercial booking agency and has also been cleared for use on television, the board states.

"This represents still another new concept in meat promotion and provides a means of reaching hundreds of thousands of theater-goers—all of them consumers—with an effective and interesting story on meat," stated Carl F. Neumann, general manager of the board.

The meat dishes used in the movie were prepared by the Meat Board's staff of home economists in a special kitchen at Wilding Studios where the movie was produced. Stand-ins for the meat cuts were also prepared to have the best appearing meat ready-at-hand under the hot spotlights.

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Q: Will two to five pounds of good sun-cured hay provide enough vitamin D for my dairy cows?

A: No. Sun-cured hay varies widely and unpredictably in vitamin D content—80 units to 1,250 units per pound have been reported for sun-cured alfalfa hay. Two to five pounds of lower potency hay would provide about 200 to 500 units per cow per day which is insignificant. Even though the hay happened to be high in vitamin D, there would be only a modest contribution made toward the suggested optimum intake of 6,000 to 8,000 units per pound of dairy ration.

Q: How can I check to make sure my dairy cows are receiving enough vitamin D?

A: Good safeguards can be taken but an absolute check is probably not possible. Optimum vitamin D levels for top performance and longevity have not been clearly established but work is in progress. Mild deficiencies are often difficult or impossible to detect but they can be costly. Available information suggests the use of 6,000 to 8,000 units of vitamin D per pound of complete grain ration. Confidence in your feed manufacturer and the good performance of his well-formulated rations would be important for users of commercial feeds.

Q: Is there any danger of my feeds having too much vitamin D?

A: Our recommendations for the vitamin D fortification of feeds are well within the generally recognized safe limits of vitamin D intake for the different species of animals. With careful methods and efficient modern mixing equipment feed manufacturers are able to achieve good distribution of micro-ingredients. The chance of overdosage is remote.

Q: How much vitamin D do baby pigs and growing-finishing pigs need?

A: Early weaning, fast growth, confinement raising, multiple farrowing and other changes have greatly increased nutritional stress factors since the vitamin D requirements of pigs have been carefully studied. Based largely on amounts that have given good results in experimental and practical swine raising programs, a number of Experiment Stations are suggesting about 500 units of vitamin D per pound of milk replacer and starter with somewhat smaller amounts as pigs approach market weight.

Q: Do sheep get enough vitamin D from natural sources?

A: Not always. For instance, in recent English studies lambs from ewes given supplemental vitamin D averaged 6 pounds heavier at weaning in one flock and 9 pounds heavier in another than lambs from ewes given no vitamin D. Fleeces from experimental animals were more than ¼ pound heavier, graded higher, and brought a premium price.

A. C. Wallis

For more complete answers to any of these questions write to Dr. G. C. Wallis, Director of Nutrition, Agricultural Department, Standard Brands Incorporated, 625 Madison Avenue, New York 22, N. Y.

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THE MANAGEMENT—William Freedman, left, and Morris Eisman check the tag on a bag of feed at the South End Grain Co., Inc., Manchester, N.H. Mr. Freedman is vice president and treasurer of the company and Mr. Eisman is president.

Feedmill Stages Comeback After Disastrous Fire

By Charles L. Stratton
Feedstuffs Special Writer

On Memorial Day two years ago, the South End Grain Co., Inc., a feedmill in Manchester, N.H., was struck by fire for a loss in excess of $150,000.

Now, with the new feedmill less than six months old at a new location, this firm is going after new customers with renewed spirit under its old policy of "No frills—good, fresh feed —all-out service"—all wrapped up in a bag marked Superior Feeds.

Morris P. Eisman, president of the firm, and William Freedman, vice president and treasurer, found that two years without a feedmill is a tremendously long time. In an effort to save their milling business after the fire, they contracted with a New York feed mill to custom mix to their own specifications in order to supply their old customers. This arrangement was a great help, but it did lack the advantages and flexibility of mixing in their own mill. Some business was sacrificed.

STORAGE TANKS—The capacity of these steel welded storage tanks, owned by the South End Grain Co., Inc., Manchester, N.H., is 800 tons. There are four soft feed ingredient tanks and four grain tanks.

EMERGENCY SWITCH—Frank Edwards, employee at the South End Grain Co., Inc., Manchester, N.H., demonstrates the use of an emergency switch that can stop mill operations if something goes wrong.

This 40-year-old feed company was incorporated in 1954 and in the years before the fire in 1958, business more than tripled. Getting old customers back and picking up new accounts takes time, but this firm, with its new feedmill, is already doing the business it did two years before the fire, and steadily building up its weekly tonnage.

Mr. Freedman points out that they are taking an ultra-conservative approach to their new mill which he feels will pay off. Though the equipment used in the mill is not all of the very latest design, greater capacity machines can be installed easily as demand may require since provision was made for this in the building of the mill.

It is not an automatic mill, but does have air valve operations with very little manual labor involved. And, it can be converted over to push-button operation with very little work.

Mr. Freedman points out that present capacity is 20 tons an hour. Pelleting capacity is not as great as he would like, but a large pellet mill is in the planning stage and this will boost tonnage appreciably.

About $200,000 has been spent in the new mill. Further expenditures to get the mill up to its rated capacity will come in time, as demand dictates.

Mr. Eisman adds, "We would rather have our present mill run at capacity now than to start off with a much larger plant and possibly have to operate below capacity. We are now being ultra conservative again. True, there is a limit to the capacity of this plant, but as yet we have not reached it."

Low Overhead

Mr. Freedman points out that company policy is to keep overhead low and feed prices attractive to the customer. "Everything is geared to keep costs down," Mr. Freedman explains. "We have always felt that the key figure in meat bird production is not conversion percentages, but the cost required to produce a pound of meat. When costs are low, our customers can continue to raise poultry during periods of low market prices and still stay in business."

In starting the construction of the new mill, a massive brick structure, which was once part of the Amoskeag Woolen Mills complex, was purchased. It is a two story building with brick walls 3 ft. thick and an all-steel frame inside. The milling section was built onto the north side of this building, which is used now to store finished goods and provide housing for the two pellet mills.

The milling section is of new concrete and steel construction, and extends another 50 ft. from the end of the building. It is this section which houses the mixing equipment, elevators, fat storage and pellet cooler. It extends from 15 ft. below street level to the top of the storage tanks, a distance of over 60 ft.

Four soft feed ingredient tanks directly above the mixer feed by gravity to the mixer scale. There are four more tanks which store hard grains. Storage for ingredients in these steel welded tanks is rated at 800 tons. A good feature, which pleases Mr. Eisman, is that all grinding of grain is done outside the mill proper. The grinding equipment is fed by gravity from storage tanks directly above.

As feed is mixed and sacked, it is stored in the main building until loaded either into freight cars or trucks. The first floor is platform height. A railroad siding was installed which runs the length of the mill. Construction has been started on the upper floor of the building for bulk loading of trucks and freight cars, and also for installing a unit to spray fat on finished pellets. A headhouse contains the scalpers for cleaning the mash and pellets.

Other than the milling crew, the staff consists of Mr. Eisman, who besides being president, refers to himself as the public relations department, nutritionist, salesman and service man; Mr. Freedman, vice president and treasurer, is also the buying agent, office and production manager.

This firm has had a great deal of experience with contractors and large growing operations within 50 miles of Manchester. It also serves some contractors in Maine. Formulations are tailor-made to meet the specific requirements of any particular program. When servicing of birds is necessary, it provides that service also, although most of these contractors have their own highly competent fieldmen and do not expect this from the grain supplier.

In several cases custom mixing is provided. Whatever the needs or desires of customers, this mill is flexible enough to conform to most demands. If special medication is needed, the mill will stop whatever it is doing to correctly medicate the proper feed as the situation on a given farm requires. Due to the mill being so close to the flocks, birds are under medication within an hour or two after the emergency phone call.

Customer Consideration

Though the number of independent poultry raisers is continually diminishing there are still a considerable number left, and these customers are given every consideration and support to enable them to continue their operations profitably. Regardless of the size of the customer, however, they must all be financially sound in order to obtain the advantage of price and service which this firm can deliver.

Modest Growing Program

In this day of fast-moving developments in the poultry field, a feed company finds it imperative to keep abreast of the times and, on occasion, develop a better approach to an old problem. The South End Grain Co. is aware of this, and is constantly testing new formulations on approximately 10 farms in the vicinity of its mill. Growers are handled exactly as though they were working for a contractor. In this way, true costs are determined and better feeds developed.

This program, as Mr. Freedman points out, enables the firm to judge the efficiency of its feed, the cost to produce a pound of meat or a dozen eggs, and also enables it to show a prospective customer what can be expected when using its feed.

CHECKUP — Employee Frank Edwards, South End Grain Co., Inc., Manchester, N.H., is pictured here checking the firm's pellet shaker located at the top of the feedmill.

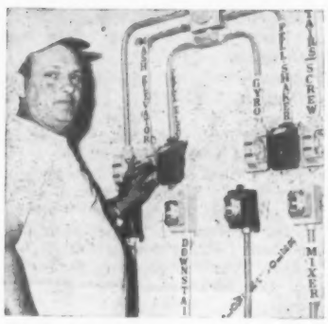
Feedmill Setup

Most of the feed mill's raw ingredients come from the Midwest and are unloaded with a Vacuvator blower. A 30-56 ton car of soybean meal, gluten or whole corn can be completely unloaded in 4½ hours into the four large trackside storage tanks holding two carloads apiece that were fabricated locally. There are also four more large storage tanks. Only eight storage tanks are required for the mill due to fast feed turnover.

Corn in trackside storage tanks

EMPLOYEE — Pictured in front of the scales at the South End Grain Co., Inc., Manchester, N.H., is Frank Edwards, a company employee who operates mixing equipment.

BAGGING OPERATIONS — Employee Al Roslau, background, does the stitching while John O'Neil, right, fills bags with feed at the South End Grain Co., Inc., Manchester, N.H. Bags are placed on conveyor-elevator which moves them to the loading crew.



CONTROL BOARD — Preparing to operate the control board pictured here is John O'Neil, an employee at the South End Grain Co., Inc., Manchester, N.H.

gravity feeds into a basement hammermill inside the mill. Then it is blown into upper storage tanks. Ingredients in upper tanks gravity flow into Fairbanks-Morse scales, the gates being controlled by air.

The scales dump into the mixer. Frank Edwards, mixer, mixes 2 tons at a time, dumping into the surge bin located underneath the floor.

Underneath the ground floor in the basement there is a 5,000 gal. thermostatically controlled liquid fat holding tank, kept filled by tank trucks. Fat is piped into a nearby work tank, also thermostatically controlled.

Two Pellet Mills

Pellets are a fast moving item here as pellet sales average 60% of total volume. Two Sprout-Waldron pellet mills of different sizes put out about 100 bags an hour. Pellets go into four lower floor holding bins. One bin holds mash for sacking. As pellets and mash are being sacked in the basement, full bags are dropped onto a belt conveyor raising to ground level where the loading crew wheels them in hand carts to either freight cars or trucks.

One man mixes while four men bag and load cars. Feed is mixed fresh, and the finished goods are put out as fast as made. The entire mill, which will be equipped for bulk feed soon, is working on the basis of a fast turnover.

Two trucks are used for local delivery. About one half of the tonnage is shipped by cars on a milling-in-transit basis.

According to Mr. Eisman and Mr. Freedman, South End Grain Co. is equipped to produce anything in the line of feed. Presently the company is producing these poultry feeds: Starter, grower, layer, breeder, meat type bird high fat starter, finisher pellet, capon pellet, pullet pellet, Lipamone feed, and withdrawal feed for last five days before processing.

South End Grain Co. is fast regaining its old customers after the total-loss fire. As Morris Eisman and William Freedman will tell you: "The fact that we built up again explains our confidence in the future of the independent feed mill."

Bill to Forgive Debts

SANTA FE, N.M.—A bill has been introduced in the New Mexico Legislature here to "forgive" the five-year-old debts of New Mexico ranchers and farmers who received drouth-year feed.

New Mexico's participation in the federal-state aid program was declared unconstitutional by the State Supreme Court after the distribution of emergency feed had been in progress more than a year. Those who received the feed under the emergency program owe the state $229,605. But no serious attempt has been made to collect.

The present bill was introduced in the House of Representatives by Robert C. Martin, a Grant County rancher and a Democrat. A similar bill offered in the State Senate two years ago was killed.

Test Shows Faster Gains for Broilers, Turkeys on Pellets

FAYETTEVILLE, ARK.—Broilers and turkey poults grew faster on pelleted diets than on mash diets, according to test results here at the University of Arkansas Agricultural Experiment Station.

Diets in which oats replaced 25% of corn were unsatisfactory when fed in mash form. When pelleted, they elicited growth similar to that obtained with the corn mash basal diets, the researchers say.

Diets containing levels of 25, 50 or 100% barley in lieu of corn were unsatisfactory as mash diets, but when pelleted they were equal to, or better than, the corn mash basal diets.

The tests indicated that the "pellet response" was not due to some chemical change taking place as a result of the pelleting process. "The added or increased growth received from the feeding of pellets was due primarily to the increased consumption of feedstuffs," the researchers concluded.

"Birds fed pellets grew faster because they ate more and had more energy available for growth after maintenance requirements were met. This increased intake of pellets accounted also for the masking effect of the pellets on high fiber diets," they added.

The tests involved 7,400 chicks and 600 turkey poults fed in nine battery trials and two trials in which the birds were reared in floored pens to study the effects of pelleting, water soaking and enzyme additions on various grains. The cereal part of the diets studied included corn, oats, wheat, barley, rough rice, milo and rice bran. Barley asd oats were also substituted at graded levels for corn.

Enzymes

Turning to the subject of enzymes, the researchers reported, the addition of two amylolytic enzyme mixtures did not improve the feeding value of the grains tested. This is in disagreement with workers in the northwestern region of the country, they noted. They suggested that the source of grain used could be an important factor in the response to enzyme treatment.

Regarding water soaking of grain, the studies found that in one test with turkeys, soaking appeared to improve corn, oats and barley diets. This effect appeared to be additive with the response to pelleting. These results were also found for corn, oats, milo, barley and wheat in one experiment with chicks. However, the results could not be repeated. The conclusion was that soaking did not consistently improve grains.

Breeder Firm Expands

SPRINGDALE, ARK. — Brown's LedBrest, Inc., breeder firm, plans an expansion of its operations in this area.

Officials report that a new research unit is being created on the firm's 600-acre farm near here and a number of new houses are planned.

They said three new houses have been built. At least five others will be constructed by summer.

The houses will have space for about 5,000 birds each, although two buildings will have individual mating pens for about 200 birds each.

HEADS UNITED FUND

ST. JOSEPH, MO. — Dwight L. Dannen, president of Dannen Mills, was elected president of the United Fund at the organization's annual meeting. Arch McClure, manager here for The Quaker Oats Co., was elected first vice president. The organization raised a total of $468,000 for various community service organizations in 1960.

PENB to Develop Product Idea Book

CHICAGO—Development of a publication describing a selected assortment of egg and layer meat products that might appeal to commercial companies for further exploration and exploitation has been proposed by the new products development steering committee of the Poultry & Egg National Board.

Lloyd H. Geil, PENB general manager, recently reported that a subcommittee of the steering group had been selected to follow through on the assignment.

The publication is to include a fact sheet on each product suggested for possible development. A preliminary list of these products includes: Frozen French toast, instant scrambled eggs, frozen fried eggs, egg dip, egg spread, canned deviled eggs, egg loaf, egg roll, frozen egg dessert, flavored egg drinks, "bird dogs," chicken bologna and chicken meat loaf.

The publication, which is to be of loose-leaf binding so that new product sheets may be added when available, is to be sent to research, product development, marketing, sales and general management personnel of food product companies.

Initial dissemination of the product idea publication has been scheduled for April.

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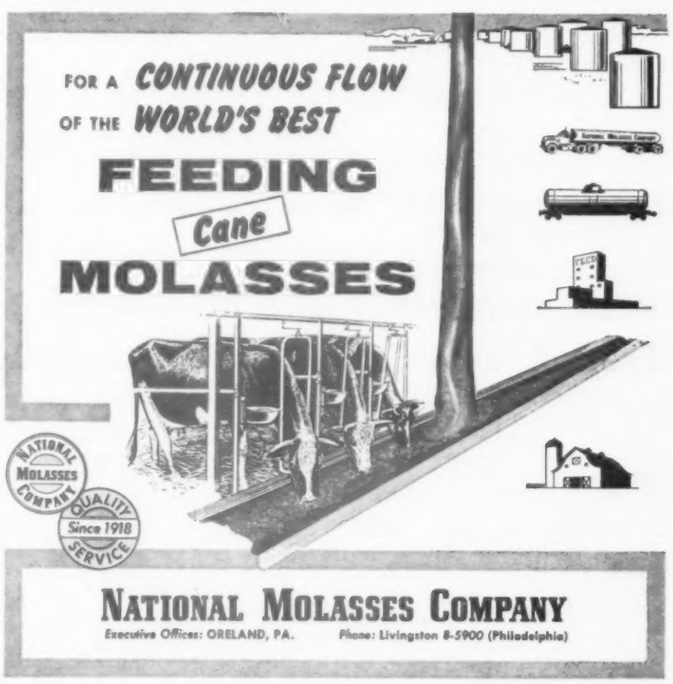

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SELLIN' SAM — By Jim Zilverberg

"Well, that pretty well covers a sound feeding program—Now if you want to rush them along a little—"

Minnesota Animal Scientist Discusses Protein Influence on Pig Performance, Carcass Quality

MINNEAPOLIS—The influence of source and level of protein on performance of growing-finishing swine and on carcass quality received a good deal of attention from Dr. R. J. Meade, University of Minnesota swine nutritionist, in a talk at the Northwest Retail Feed Assn. conference in Minneapolis.

Summarizing and commenting on recent Minnesota research in this field, Dr. Meade made these observations:

—"If you use good quality feedstuffs, rations containing 15% of protein up to 100 lb. of weight and 12% thereafter will result in good pig performance."

—"As you go from normal to low levels of protein, there is some increase in backfat and some decrease in loin eye area. But using higher than normal protein levels will not help carcass quality. Producers should aim for meat-type hogs through good breeding programs not through high-protein rations or feeding gimmicks."

—"A combination of soybean meal and corn will give about as good a balance of amino acids as one can get. For example, a 15% corn-soy ration was not improved by adding amino acids or substituting other protein sources."

Test Results Cited

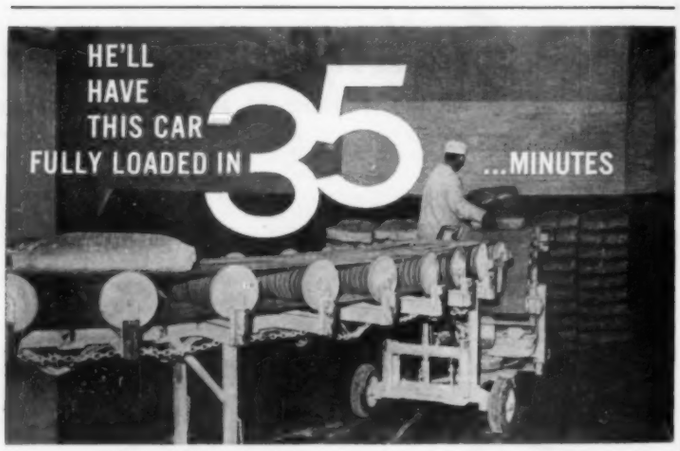
Dr. Meade reported the results of several swine feeding tests. In addition to protein, pelleting and other factors were studied.

In an experiment at the Morris, Minn., branch station, pigs were fed levels of 18, 15 and 13% protein up to 100 lb. of weight and 15, 12 and 10% thereafter. Gains were less on the 13-10 combination. Free choice feeding resulted in good gain and feed efficiency, and the pigs used about the same amount of protein as on the 15-12 combination. In another test, feed efficiency was best on free choice, gain was the same, and protein was not over-consumed. In another study, free choice feeding gave the best performance, but the pigs over-ate on protein.

Dr. Meade said that pigs may overeat on soy, but minerals in the feed will reduce palatability.

Results of a protein study at the Grand Rapids, Minn., station were presented by Dr. Meade. This involved protein combinations of 18-15, 16-13 and 14-11. Pigs on the lower levels gained somewhat slower, and there was a tendency toward poorer carcasses. It was reported that rations based on corn and soybean meal and nutritionally adequate in all nutrients were not improved by replacing part of the soy with meat and bone scraps or fish meal.

The report concluded that properly balanced rations containing 16% protein up to 100 lb. and 13% thereafter will promote excellent performance of growing-finishing pigs. Results of other tests, it was noted, indicate that a 15-12 combination is adequate. "When a reasonable cost



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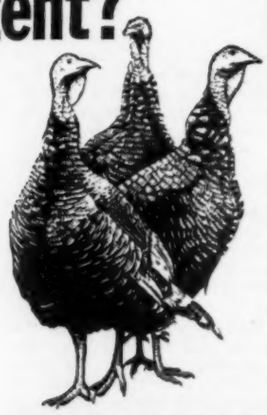

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situation exists," the researchers continued, "at least one third of the soybean meal in supplements can be replaced with meat and bone scraps or fish meal without hurting performance. This applies although such substitutions will not generally improve performance."

Feeding more than normal protein will not generally result in marked improvements in carcass quality, they observed. "It appears," said the report, "that it is more feasible to produce meat-type hogs through sound breeding."

Dr. Meade said, in comparing protein levels with the 15-12 combination, that as one gets down to 14-11 or 13-10% combinations, he sees that gains begin to decrease.

Pelleting

Another study, at the Waseca, Minn., station covered protein content plus effect of ground ear corn in mixed rations, effect of pelleting and value of protein sources other than soy.

Feeding of ground ear corn resulted in average reduction of 13% in rate of gain, while feed efficiency, based on shelled corn equivalent, was improved. Rations containing 15 and 12% protein promoted as rapid gains as higher protein rations. Pelleting improved performance, but feed saving was not enough to offset the additional cost. Meat and bone meal was an "excellent" replacement for one third of the soy in all rations but the 15 and 12% protein rations based on ground ear corn.

The researchers concluded that finely ground ear corn promotes slightly slower and slightly more efficient gains than ground shelled corn in properly balanced complete rations. Some advantage other than from feed saving, it was noted, may accrue because of reduced corn storage and handling costs.

Pelleting complete rations based on ground ear corn or ground shelled corn does not improve feed efficiency enough to offset processing costs, it was indicated.

When the price relationship is "correct," the report said, meat and bone scraps can replace one third of the soy with satisfactory results.

Barley Rations

A test at the Crookston, Minn., station concerned pelleted barley rations. After outlining the data, the researchers concluded: (a) Rations containing about 14% of protein and fed throughout growing-finishing result in as rapid and efficient gains as a 16-13% combination. (b) Solvent soy alone is an "excellent" source of supplemental protein in pelleted barley rations containing adequate total protein. (c) Blood meal, tankage and fish meal can satisfactorily replace part of the soy "when the cost of these ingredients justifies their use." Rate or efficiency of gain generally is not affected by these ingredients. (d) Tankage alone appears to be a satisfactory source of supplemental protein in pelleted barley rations containing some 15% of protein initially and 12% after the pigs weigh 100 lb.

When commenting on carcass quality, Dr. Meade said that use of bulky rations for carcass quality purposes may result in more total feed use and more time. He also indicated that hand feeding is not practical.

Dr. Meade advised the feed men to encourage their customers to get on to a good breeding program. He suggested using a new boar each year in order to improve the herd.

He also cited information noting a correlation between meat-type hogs and feed conversion results. Thus, he said, there seems to be an opportunity to reduce feed use through breeding.

'Port of Embarkation' Sought for Salisbury

SALISBURY, MD.—The Maryland Port Authority has passed a resolution recommending that Salisbury be designated as a port of embarkation. The recommendation will go to the customs department for final action.

In recent years a considerable amount of frozen poultry has been shipped from Salisbury to European markets. Besides being in the center of one of the nation's large broiler areas, Salisbury is also in the center of a large corn and soybean area. A high percentage of the grain now is exported from Baltimore and Norfolk, Va. It is possible that grain could be shipped from Salisbury.

Acceptance of Salisbury as a port of embarkation would eliminate charges paid by ship owners for customs inspections. At present, customs inspectors are sent from Baltimore when a foreign ship reaches Salisbury. This expense is borne by the ship owner.

If Salisbury becomes a port of embarkation, such expense would be borne by customs. With foreign traffic increasing at the port here, Avery W. Hall, Salisbury business man and member of the authority, has been seeking the designation as an added inducement to shippers.

Egg Production Drops

OTTAWA—Production of eggs in Canada in 1960 amounted to an estimated 457,140,000 doz. or a decrease from the previous year's 460,004,000 doz. by 6%. The bureau of statistics reports that fewer eggs were produced in each of the first six months as compared with 1959, while the opposite was true for the last six months. During the year there were decreases in Quebec, Manitoba and Saskatchewan, and increases in the other provinces.

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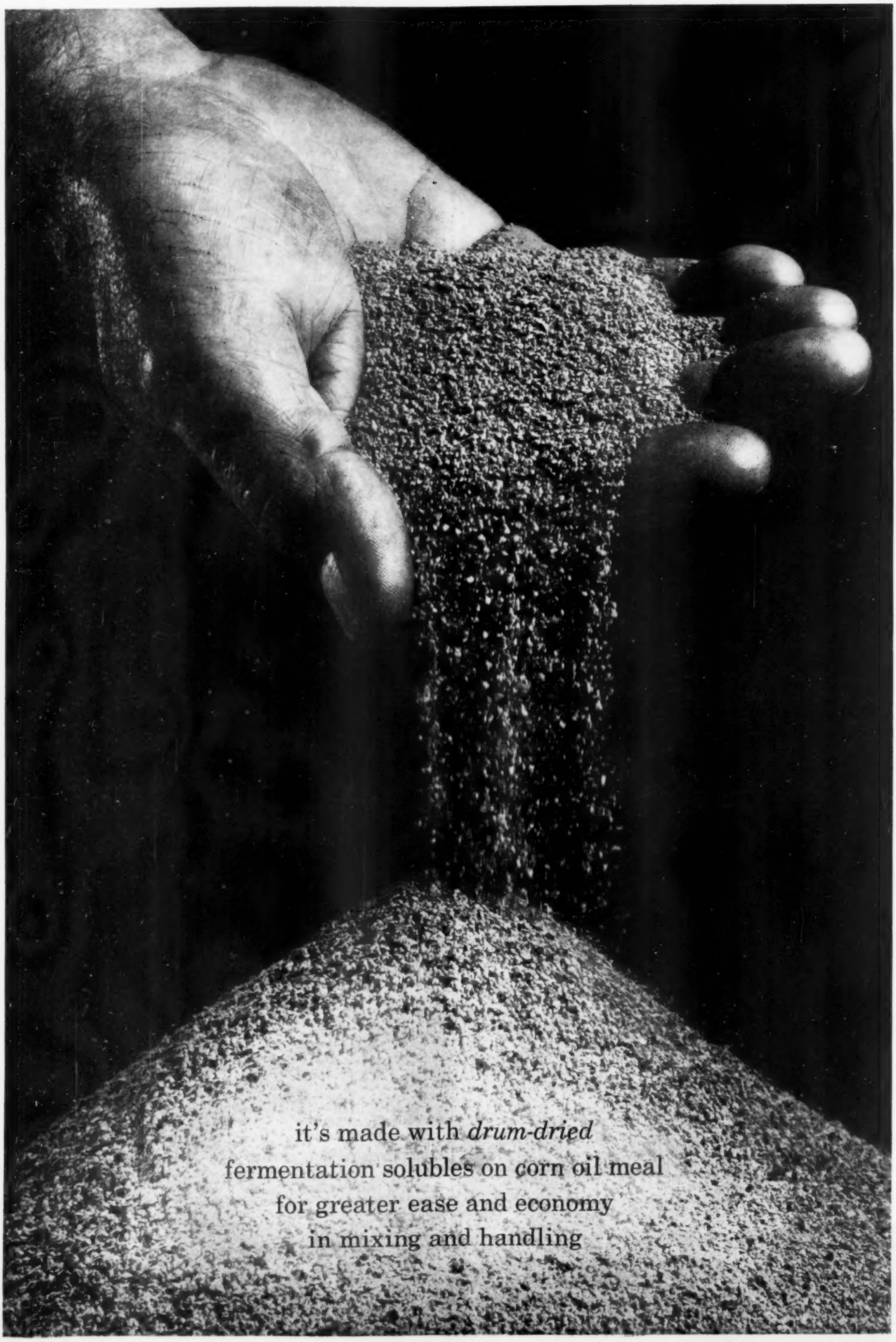
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Comments on Medicated Feed or Water Intake as Related to Age, Body Weight

AMHERST, MASS. — Questions in regard to medicated feed and water intake as related to body weight of poultry were raised and discussed in a report by Dr. G. H. Snoeyenbos, University of Massachusetts veterinarian, in a university publication.

He indicated that drug dosage levels could vary considerably with variations in birds' age and body weight and feed and water intake. "It is surprising," he asserted, "that drug response to feed or water medication is not less predictable than is the case."

"Medication by the feed or drinking water is often the only practical means of administration," Dr. Snoeyenbos said in commenting on drug use and response in poultry. "Drugs are usually mixed in drinking water at one half the concentration of that used in feed. This ratio is based on the generalization that poultry will drink 2 lb. of water for each pound of feed consumed. Usually no allowance is made for the age of the birds medicated or for the environmental conditions at the time of medication.

"The idea has developed that a given concentration of a drug either in the feed or drinking water results in highly precise dosage, and for this reason it is expected that quite uniform results should be obtained. The fact is that uniform results are not obtained and that there are several important reasons for this apparent inconsistency without regarding the errors in measurement or variations in sensitivity of infectious agents to a given drug. Under most circumstances the effectiveness of a drug is dependent upon the amount supplied to the animal for each pound of body weight. On this basis, a 4-lb. chicken should receive twice as much drug in a 24-hour period as a 2-lb. chicken if comparable results are to be obtained.

"The accompanying table of relative feed and water intake in relation to age and body weight has been computed from data furnished by Medway and Kare (Poultry Science, May, 1959).

"These data were gathered from Leghorns maintained at temperatures which have little effect on metabolic rate. Under commercial conditions the variability could be much greater. A number of disease conditions are capable of widening the differences still further. It may be noted that during the first week of a chick's life food consumption in relation to body weight is almost three times greater than during the 16th week. If similar levels of feed or water medication were used at these two ages, the dosage would be almost three times greater for the chick than for the 16-week-old bird. A rather similar variation occurs in water intake versus age and weight. These data also demonstrate that the rule of thumb that a bird consumes twice as much water as feed is often erroneous. The 32-week-old laying birds, for example, consumed over 3½ lb. of water for each pound of feed consumed.

Weight Ratios Between Water and Feed Intake and Body Weight of White Leghorn Chickens at Various Ages

Age in weeks	lb. feed: lb. chick	lb. water: lb. chick	lb. feed: lb. water
1	1: 5.95	1:2.33	1:2.56
2	1: 6.08	1:2.58	1:2.36
3	1: 7.49	1:2.92	1:2.57
4	1: 7.63	1:3.30	1:2.31
6	1: 9.91	1:4.81	1:2.06
8	1:11.68	1:4.96	1:2.35
16	1:17.13	1:7.81	1:2.19
32	1:14.94	1:4.21	1:3.55

"Other data not reproduced here shows that in very hot weather a laying hen will consume almost four times as much water as she will on a cold day. If water medication is to be used under these two circumstances, it is obvious that the dosage on a hot day would be four times greater than that in cold weather. Under some conditions the level of a drug may be too low during cold weather to be effective, and the same dosage during hot weather would be so high that real harm could be done because of toxicity. The actual bulk of the ration as is usually related to energy content and feed intake per bird per day can, of course, also have a striking effect.

"Drug dosages may also be greatly influenced by acceptability of medicated feed or water. It is not unusual for water intake to decrease as much as 50% following addition of some medicaments. The drug dosage decreases accordingly. Drugs are usually more readily accepted in feed than in water."

Dr. Snoeyenbos went on to say that there are reports which show variability in drug sensitivity among different strains of a given infectious organism. He said some strains have acquired "an almost complete tolerance to drugs that ordinarily are highly effective."

"With the above considerations in mind," he said, "it is rather surprising that drug response to feed and water medication is not even less predictable than is the case."

New Sales Office

MUNCY, PA.—Establishment of a Latin American sales headquarters in San Antonio, Texas, has been announced by Sprout, Waldron & Co., Inc. Gerald R. Senra will be in charge, according to Harold J. Alsted, vice president in charge of sales.

The advantages anticipated by this move include having close to the Mexican market the direction of all sales aimed at the entire Latin American market, Mr. Alsted commented.

Prior to moving to San Antonio, Mr. Senra was Latin American sales manager with headquarters here for three years. For the past 10 months, he has been living and working in Mexico City.

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High Levels of Copper For Growing-Finishing Swine

"It appears that 5-10 ppm copper is adequate to meet the nutritional requirements of the pig. Additional copper, up to a maximum of 100 ppm, may result in a beneficial bacteriostatic effect under certain conditions. Higher levels of copper should not be fed to swine."

By Dr. Harold D. Wallace
University of Florida

Copper has been recognized as a dietary essential of the pig for many years. In 1932 Elvehjem and Hart (1) demonstrated that copper along with iron was needed for hemoglobin formation in anemic pigs. Since copper is not a structural part of the hemoglobin molecule it has been generally assumed that the element performs its function in hemoglobin synthesis as an enzymatic catalyst. The presence of copper in several body enzymes is well established.

The minimum copper requirement of the pig has not been very clearly defined. National Research Council recommendations suggest 4.5 mg. per pound of feed or approximately 10 ppm. for the very young pig. It is assumed, since there is no evidence to the contrary, that this level is adequate for all classes of swine. Additional research is needed to better establish the minimal requirements of swine.

Experimental copper deficiency in young growing pigs has been described by Teague and Carpenter (2). The usual dietary anemia was encountered along with an unusual leg condition. The leg joints showed a lack of rigidity and the hocks became excessively flexed and forced the animals to assume a sitting position. The forelegs exhibited various types and degrees of crookedness. Copper was therapeutic and in some cases brought about a complete reversal of symptoms.

Nutritional anemia is a widespread malady in suckling pigs. The presence of adequate bodily stores and/or the access of the pig to copper contaminated surroundings has minimized the practical importance of copper in nutritional anemia. Most cases are prevented by or respond to iron therapy without supplementing copper. Injectable iron compounds formulated without copper are proving extremely effective for the prevention and cure of anemia in suckling pigs.

RECENT INTEREST IN THE FEEDING OF HIGH LEVELS OF COPPER TO PIGS — The original idea for using high levels of copper in pig diets was conceived by workers in England. In 1948 Braude (3) observed that young pigs fed a normal diet showed an unusual craving for metallic copper. This observation prompted further research and in 1955 Barber et al. (4) reported that the daily gains of growing pigs were significantly improved by feeding 250 ppm. of supplementary copper as copper sulfate. A second report by these workers (5) indicated that the same high level of copper increased gains to about the same extent as did effective antibiotics. Several more recent papers from England have confirmed the earlier reports.

The first reported study on this problem conducted in the U.S. was that of Bass et al. (6) of the Florida Station. Using a conventional fortified low protein corn-soybean meal ration supplemented with 250 ppm. copper as copper sulfate these workers observed that the copper not only depressed gains and feeding efficiency but produced toxicity in some pigs. This result was somewhat unexpected and prompted a series of experiments that have been published by Wallace et al. (7).

HIGH LEVEL COPPER FEEDING AT THE FLORIDA STATION —Since the 250 ppm. level of copper caused toxicity it seemed desirable to study the effects of feeding lower levels. Results of such an experiment are presented in Table 1. Pigs supplemented with 100 ppm. ate more feed and gained faster than any of the other groups. The group that received 150 ppm. copper performed better than the controls but one pig in this group died during the trial and a liver analysis indicated an extremely high concentration of copper. The pigs that were fed 200 ppm. supplementary copper performed on a par with the control pigs. Figure 1 shows the average hemoglobin value at two week intervals commencing after six weeks of the trial to the termination of the trial. After six weeks on experiment, pigs receiving 200 ppm. copper were significantly lower in hemoglobin than the other groups. This difference persisted to the end of the trial with some tendency toward recovery. However, this undesirable influence on hemoglobin indicates that the 200 ppm. copper was in the danger zone of toxicity. There is some suggestion in the hemoglobin data that 100 ppm. copper may have favorably influenced hemoglobin formation. At any rate, the

Dr. Harold D. Wallace

AUTHOR — Dr. Wallace earned his B.S. and M.S. degrees from the University of Illinois. He completed requirements for his Ph.D. in animal nutrition at Cornell University and in 1950 joined the staff of the department of animal husbandry and nutrition at the University of Florida. He has been in charge of swine research and teaching there for 10 years. His research has covered a wide range of swine nutrition and management problems.

TABLE 1. Various Levels of Copper for Growing-Finishing Swine*

Copper added, p.p.m.	0	100	150	200
Initial number of pigs	10	10	10†	10
Average initial weight, lb.	53.2	53.0	53.0	53.1
Average final weight, lb.	185.0	198.0	192.0	186.0
Average daily gain, lb.	1.53	1.70	1.61	1.54
Average daily feed intake, lb.	5.00	5.65	5.20	4.97
Feed per lb. gain, lb.	3.26	3.32	3.23	3.23
Days on experiment	87	87	87	87

*The basal ration consisted of 78.5% ground yellow corn, 17.0% soybean oil meal (44% solvent extracted), 1.0% ground limestone, 1.0% steamed bone meal, 0.5% trace mineralized salt and 2.0% vitamin premix. No antibiotic fortification was included. Approximately 22 p.p.m. of copper was present in the basal mixture.

†One pig died after 52 days on test. Autopsy revealed evidence of probable poisoning from copper. Liver analysis indicated an unusually high accumulation of copper. Other pigs in this group showed only a moderate increase in liver copper levels over the controls.

TABLE 2. Various Levels of Copper and Zinc Combinations for Growing-Finishing Swine*

Treatment group	1	2	3	4	5
Copper added, p.p.m.	0	4	200	0	200
Zinc added, p.p.m.	0	20	500	500	0
Initial number of pigs	10	10	10	10	10†
Average initial weight, lb.	45.7	45.0	45.7	45.3	45.9
Average final weight, lb.	178.9	174.9	176.7	172.6	174.4
Average daily gain, lb.	1.59	1.55	1.56	1.51	1.53
Average daily feed intake, lb.	4.79	4.85	4.91	4.96	5.01
Feed required per lb. gain, lb.	3.01	3.13	3.14	3.28	3.27
Days on experiment	84	84	84	84	84

*Basal ration similar to that fed in Experiment 1.
†One pig died after 46 days on test. Cause of death not determined.

FIGURE 1. Influence of Various Levels of Copper on Hemoglobin Levels of the Pig

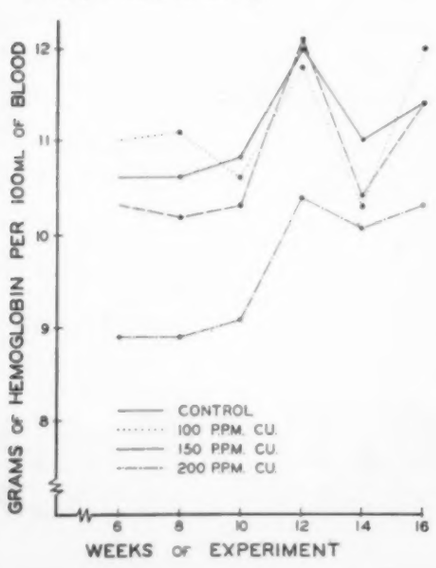


FIGURE 2. Influence of Copper and Zinc on Hemoglobin Levels of the Pig

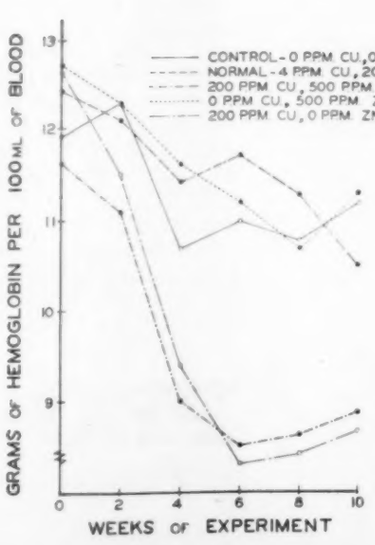
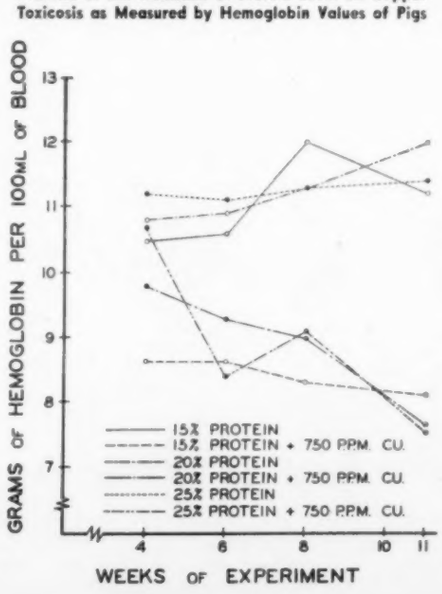


FIGURE 3. The Influence of Protein Level on Copper Toxicosis as Measured by Hemoglobin Values of Pigs



gains and feed consumption data favored this level of copper.

POSSIBLE COPPER AND ZINC INTERRELATIONSHIPS—The next experiment was prompted as a result of observations in our nutrition laboratory using rats that an antagonism exists between copper and zinc with respect to liver storage. Results of a feeding trial designed to explore this relationship are summarized in Table 2. Differences in gains between various treatments were small and non-significant. The basal group, without supplementary copper or zinc, actually gained slightly faster and more efficiently than the experimental groups. There was no clear evidence, however, that copper and zinc, either singly or in combination at levels of 200 and 500 ppm., respectively, affected feedlot performance of the pigs. Hemoglobin values (Figure 2) determined regularly throughout the trial again demonstrated that 200 ppm. copper markedly reduced hemoglobin. By the fourth week of the experiment pigs fed the 200 ppm. copper, irrespective of zinc supplementation, were significantly reduced in hemoglobin. After six weeks pigs in these two groups were dangerously depleted in hemoglobin. After the sixth week a slow but definite improvement was again observed. Liver copper values indicated a 3-4 fold increase due to the copper feeding. No evidence was obtained to suggest that the supplementary zinc was affecting liver copper accumulation.

A third experiment designed to further explore the possible interrelationships of copper and zinc is summarized in Table 3. The most interesting observation concerned the incidence of parakeratosis. Three of the four pigs in group 1 (no supplementary copper or zinc) developed severe symptoms of parakeratosis after about five weeks on test. No other cases were observed. All other groups received either supplementary copper or zinc or a combination of the two elements. These results, although not conclusive, would seem to corroborate the observations of Hoefer et al. (8), in that copper as well as zinc gives protection against parakeratosis. Since the performance of the pigs in group 1 was adversely affected by the parakeratosis there can be no meaningful expression of individual responses compared to the control. However, in comparing the performance of group 2 with group 3 it is again apparent that 500 ppm. zinc had little influence on the performance of the pigs. The small number of pigs fed in groups 4 and 5 preclude any strong conclusions, but results suggest that 1,000 ppm. zinc may have impaired performance. Work by Brink et al. (9) demonstrated that weanling pigs were able to tolerate 0.1% zinc in the diet while higher levels produced symptoms of zinc toxosis. It is clearly evident from this study that pigs fed 150 ppm. copper performed better than pigs fed 300 ppm. copper.

HIGH LEVEL COPPER AND ANTIBIOTICS COMPARED AS GROWTH STIMULANTS — Barber et al. (5) reported that 250 ppm. supplemental copper as copper sulfate increased gains in weanling pigs to the same extent as did effective antibiotics. Hawbaker et al. (10) have published results indicating that copper sulfate improved performance as much as oleandomycin or oxytetracycline and that a combination of copper sulfate with either of the antibiotics resulted in an additive effect on rate of gain. On the other hand a study reported by Scott (11) involving levels of 50 and 250 ppm. of copper alone and in combination with chlortetracycline and/or brewers dried yeast showed that only the antibiotic increased gains significantly. A Florida experiment designed to compare the response of pigs to copper and chlortetracycline alone and in combination is summarized in Table 4. Based on previous tests, 100 ppm. copper was selected as the most likely effective level without causing toxicity. Gains were not improved by this level of supplementation but a mrked improvement in feed conversion was observed. Both groups fed 20 gm. chlortetracycline per ton of

(Turn to page 45)

TABLE 3. Various Levels of Copper and Zinc Combinations for Growing-Finishing Swine

Treatment group	1	2	3	4	5
Copper added p.p.m.	0	150	150	300	300
Zinc added p.p.m.	0	500	0	1000	0
Number of pigs started on test	4*	8	8	4	4
Average initial weight, lb.	45.3	46.0	47.0	46.5	45.5
Average final weight, lb.	131.8	170.3	171.3	152.3	160.8
Average daily gain, lb.	1.24	1.76	1.78	1.51	1.65
Average daily feed consumption, lb.	4.22	5.59	5.20	4.25	5.33
Feed required per lb. gain, lb.	3.40	3.18	2.92	2.81	3.23
Days on experiment	70	70	70	70	70

*Three of the four pigs were afflicted with severe parakeratosis commencing at about five weeks. This accounts for the poor performance of pigs in Group 1.

TABLE 4. Response of Growing-Finishing Swine to Copper and Chlortetracycline Alone and in Combination

Treatment group	1	2	3	4
Copper added p.p.m.	0	100	0	100
Chlortetracycline added, gm. per ton	0	0	20	20
Number of pigs started on test	8*	8	8†	8
Average initial weight, lb.	41.1	41.1	41.6	41.1
Average final weight, lb.	175.1	174.4	201.0	190.8
Average daily gain, lb.	1.66	1.66	1.99**	1.86**
Average daily feed consumption, lb.	5.98	5.08	6.48	6.05
Feed required per lb. gain, lb.	3.60	3.06	3.26	3.25
Days on experiment	80	80	80	80

*One pig removed after 14 days of the test because of unthriftiness.

†One pig removed after 42 days on test because of anul prolapse (pig had gained very well while on test).

**Significantly different from performance of pigs in Lots 1 and 2 ($P < .01$).

TABLE 5. The Influence of Protein Level on Copper Toxicity*

Treatment group	1	2	3	4	5	6
Crude protein level, %	15	15	20	20	25	25
Added Cu., p.p.m.	0	750	0	750	0	750
Number of pigs per group	10	10	10	10	10	10
Average initial weight, lb.	56.0	55.9	56.2	56.5	56.1	55.9
Average final weight, lb.	166.0	119.6	161.5	136.2	146.0	135.7
Average daily gain, lb.	1.43	0.83	1.37	1.04	1.17	1.04
Average daily feed consumption, lb.	4.98	3.33	5.01	4.12	4.50	4.31
Feed required per lb. gain, lb.	3.48	4.01	3.66	3.96	3.84	4.14
Days on experiment	77	77	77	77	77	77

*Copper effect significant ($P < .01$).
Copper-protein level interaction significant ($P < .01$).

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"Vitamin-Like Unidentified Growth Factors from Corn Distillers Dried Solubles"

DR. H. D. WALLACE
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"New Developments in the Feeding and Management of Sows"

DR. T. D. RUNNELS
University of Delaware
"Processed Whole Soybeans as an Ingredient in Broiler Diets"

DR. J. H. CONRAD
Purdue University
"Recent Research and the Role of Unidentified Growth Factors in 1961 Swine Rations"

DR. PHILIP J. SCHAIBLE
with Hugh Travis
Michigan State University
"The Value of Corn Distillers Dried Solubles in Mink Rations"

DR. N. L. JACOBSON
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STABILITY– normal storage conditions – 4 gm premix at average room temperature and humidity

	% Potency Retained		
Avg of 3 lots	**30 Days**	**90 Days**	**120 Days**
New Process Hetrogen K Premix	99%	98%	99%
Ordinary Vitamin K Premix	84%	67%	52%

STABILITY– field samples–ordinary vitamin K premix recently secured from feed mills

	% Potency Retained
Average of 7 lots	23%

(Actual potency of individual lots ranged from 0 to 45%)

STABILITY– adverse storage conditions – accelerated storage conditions 113°F at 80% relative humidity

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feed gained significantly faster on less feed than the control group. Results of this experiment indicate that only the chlortetracycline exerted a favorable influence on gain and no additive effect from copper and chlortetracycline was observed.

STUDY OF CERTAIN FACTORS THAT MAY INFLUENCE THE COPPER EFFECT—Since the British data generally are not in agreement with Florida data, both from the standpoint of the effectiveness of copper and the manifestation of copper toxicity, work was undertaken to determine possible reasons for this. The first test along these lines involved a method of feeding trial in which pigs were fed high levels of copper in both dry meal and as a slurry. Results measured in terms of gains, feed conversion and hemoglobin levels showed essentially the same effects from the copper feeding in the dry meal as in a slurry.

McCall (12), working in our laboratory, has demonstrated that high levels of protein is the form of casein alleviated copper toxicity in rats. Realizing that British workers used somewhat higher levels of protein in their basal feed mixtures than were employed at Florida it was decided to investigate this relationship. The data from such a study are presented in Table 5. A very high level of copper (750 ppm.) which was expected to produce severe toxic symptoms was fed with rations containing three levels of crude protein (15, 20 and 25%). As expected, the copper proved toxic but a protective action due to protein was clearly evident. An analysis of the growth data showed a highly significant adverse effect due to copper and a highly significant interrelationship between the copper and protein level. As the protein level increased the copper toxicosis was less pronounced. It is also of interest to point out that the pigs performed better on 15% protein than on 20% and better on 20% than on 25%. This is in accord with other recent observations at this station using corn-soybean meal type mixtures. At the time the trial was concluded many of the pigs on the copper treatments were obviously severly poisoned and would not have survived much longer on the rations. All but one pig recovered but recovery was painfully slow for several of the animals. The hemoglobin values shown in Figure 3 are very much in accord with the growth performance of the pigs. After four weeks on test, hemoglobin values

Latest Rulings in Labor Relations

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ARBITRATOR'S DECISION
YES, THIS DOES NOT INTERFERE WITH EMPLOYEE'S FREEDOM OF CHOICE.
Based on a 1960 Ohio decision

values revealed the same protective action from dietary protein; however, this became less apparent as the experiment progressed and when terminated all groups on the copper rations were deficient in hemoglobin.

HIGH LEVELS OF COPPER AND REPRODUCION—This is an area in which very little information is available. An experiment at Florida involving only a few animals indicated that 300 ppm. copper fed throughout the growing-finishing period and continued during gestation did not interfere with estrus or conception but may have induced heavy embryonic death resulting in mummified fetuses. Further research is needed.

SUMMARY—In summation it would seem fair to state that high

(Turn to COPPER, page 71)

WHO ME?

Yes, Kraco, the fresh-dried, naturally sweet whole whey by Kraft, provides important milk by-product nutrients essential for the development of baby calves —and after a good start, "keeps 'em on the grow."

ME, TOO?

Yes, Kraco sparks pig feed with milk sugar (lactose) and protein (largely lactalbumin). Lactose is the most digestible milk sugar for baby pigs, makes the feed taste better and furnishes quick energy. Lactalbumin is one of nature's best proteins for rapid growth.

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Suggestion Offered on Dust Collection System for Medicated Mixes

A Minneapolis feed manufacturer has offered a suggestion on handling of collections of dust from drug-containing feeds.

The suggestion—reported in the "Feed and Feeding Digest" issued by the Grain & Feed Dealers National Assn.—was prompted by an earlier suggestion on the disposition of dust collections in order to comply with Food and Drug Administration regulations on the handling of medicated feeds in feed plants.

The recent comments came from F. T. Heffelfinger II of Peavey Feed Mills, Minneapolis. The comments follow:

"I have one suggestion to make which might be helpful to other feed manufacturers or feed dealers. It is important that each operator consider this carefully. In a recent 'Digest' is a question regarding collections from dust systems. In most cases, feed additives are expensive and very specific to the feed in which they are being mixed. Consequently, it is uneconomical to throw away the collections and impractical to store such collections for future use in other batches of the same feed.

"We feel the only answer is to make the necessary adaptations of dust collection systems so that material gathered off of the mixers is returned immediately to the stream as it is being discharged from the mixer. The same principle applies to all the equipment in the plant where it is necessary to have dust collection systems. The idea is to collect the dust and return it immediately into the stream as close as possible to the source of collection.

"To assure that dispersion of critical additives is uniform in the system so revised, it is necessary to run laboratory assays on the drugs involved. Once you have assured yourself that the collection of dust can be returned to the stream without affecting the mix, the problem is virtually solved."

Egg Bill Introduced

LITTLE ROCK, ARK.—A bill to repeal the Arkansas egg grading law has been introduced in the Arkansas House of Representatives.

The measure, House Bill 167, was introduced by Representative Boyd Carpenter of Sharp County. It is presently in committee, and legislative officials give it little chance for passage.

The original Egg Marketing Act required that all eggs sold at retail in Arkansas be graded and stamped with an inspection seal.

Arkansas poultry and feed officials have reacted vigorously against the new measure.

test shows

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3. "The weight gain response to zinc bacitracin was not as good as the response to bacitracin methylene disalicylate*.

4. "Penicillin gave the poorest response of all antibiotics tested."

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Jack W. Helms Joins Ralph Wells & Co.

MONMOUTH, ILL. — Jack W. Helms has been appointed field sales supervisor for Ralph Wells & Co., Monmouth, according to Lou Kanakis, sales manager. Mr. Helms has nine years of sales and promotional experience in the pet food field.

Jack Helms

In addition to selling, he will assist customers with new sales and promotional ideas, packaging and other marketing suggestions. He started as a dog food salesman for Vitality Mills, Chicago, in 1952. He was promoted to sales manager in charge of five territories in 1954.

Mr. Helms contacted feed manufacturers in Texas for the Chase Bag Co. for two years after leaving his position with Vitality Mills in 1957.

Before coming to Wells, he was a representative to national food and pet food manufacturers for Oliver-Taylor Co., food brokers in Ft. Worth, Texas. To this post he coordinated national advertising and promotion for large chain stores.

Research With Lighted Laying Houses Told

MEMPHIS, TENN. — Agricultural engineers attending the 1960 winter meeting of the American Society of Agricultural Engineers here were told that a constant 15-hour day-length for a 60-week production period produced a significant increase in egg production and labor income in experiments with white leghorn hens.

Dr. R. H. Brown and R. E. Smith, agricultural engineers at the University of Georgia, Athens, said that supplemental lighting at average intensities from ½ to 15 footcandles were used to supplement the natural day-length for the lighted hens whose egg production and labor income was compared with that of hens with the natural day-length.

The two ag engineers reported no significant difference in production or income between pens with different light intensities of the supplemental lighting.

An increase in mortality in the lighted pens was reported to be significant at the 5% level, but the results of other lighting studies indicates this might be attributed to chance, they said.

And they stated that the economic advantage gained by the use of supplemental lighting appears to be related to the season in which the hens come into production.

Swine Fed Garbage

SAN FRANCISCO—As of November, 1960, more hogs were being fed garbage in California than in any other state. It was reported that 241 establishments were feeding 156,000 hogs on garbage during the month.

All garbage fed to hogs in California is now cooked. In the nine western states, only 1,300 hogs out of 201,000 were eating non-cooked garbage by November of 1960. This amounts to 0.6%, compared to 3% for the country as a whole. In five western states — California, Oregon, Montana, Idaho and Nevada — all garbage-fed swine were eating cooked garbage.

HATCHERY MANAGER NAMED

SPRINGDALE, ARK.—G. T. Rawson has been named hatchery manager of the Arbor Acres Farm hatchery at Tenaha, Texas, according to an announcement by Jerry Hinshaw, southwest divisional manager.

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Nebraska Swine Specialists Discuss Farrowing Facilities, Other Topics

LINCOLN, NEB. — Hogmen are still debating the merits of farrowing stalls vs. farrowing pens for sows, and researchers at the University of Nebraska say that they and others are trying to come up with some answers.

Discussions of farrowing stalls and other aspects of swine production were presented by Nebraska specialists at a series of Rooters Days held at four points in the state.

The discussions included such things as farm mixing of feeds, the disease-free pig program and confinement systems in addition to farrowing facilities.

The swine producers were told that "home mixing of feeds for swine can be profitable to the producer if he mixes all the feed for at least 15 to 25 sows and their litters per year, based on studies made at various agricultural experiment stations."

At the same time, they were told that "quite often, the comparative cost of commercial feeds and home-mixed feeds will make it impractical to mix your own feeds."

FARROWING—The discussion of "Farrowing Stalls — the Shape May Be Important" was presented by Dr. E. R. Peo, Jr., of the University of Nebraska.

"Data collected at the Nebraska station (Table 1)," he said, "indicate that pens are better than stalls for farrowing sows.

"With the development of intensified swine programs, the use of farrowing stalls has become widespread and their value for reducing pig mortality has been accepted as fact. However, in the Nebraska study, sows farrowed in pens weaned approximately one more pig per litter than those farrowed in stalls. In addition, the average weaning weight for pen-farrowed pigs was 3 lb. more than for those stall-farrowed. On the basis of these data, there appears to be no particular advantage for the use of farrowing stalls.

"However, are these data truly indicative of what swine producers can expect if they use stalls for farrowing? The answer is yes if swine producers expect equipment to substitute for personal attention or use poor management such as farrowing sows in the same stall over a prolonged period of time without a clean-up between sows or farrowings. The answer may also be yes simply because unnatural restrictions are placed upon the sow when she is confined to a stall.

"Conventional type stalls (rectangular-shaped) do not allow sows to obey their natural nesting instincts and the stress from this restriction certainly must affect sow performance. Recently, the University of Nebraska introduced the concept of a round stall for farrowing. The round stall has all the advantages of a conventional stall plus an additional advantage of allowing the sow to obey her natural instincts at farrowing time. Although the data are limited, the results shown in Table 2 indicate a more favorable performance for sows farrowed in round stalls as compared to those farrowed in conventional, rectangular-shaped stalls. Four of seven sows fought to get out of the rectangular-shaped stalls, but none fought the round stalls. Nine percent of the pigs farrowed by sows in rectangular-shaped stalls were born dead as compared to 4.3% for those farrowed in round stalls. Four of the sows in rectangular stalls required hormone therapy to stimulate milk flow, but only one sow in the round stall required treatment. No disadvantage relative to effect on sow performance was observed with the round stall when compared with the rectangular-shaped stall. The only disadvantage that has been noted with the round stall is that it requires more building area than a conventional stall. However, from a management standpoint sows are easier to take care of in a round stall. Thus it appears that the advantages of a round stall more than outweigh its disadvantage.

"Will farrowing stalls play a role in swine programs of the future? Only time will tell but certainly more and more swine producers are becoming discouraged in their use. Yet, intensified swine programs almost demand the use of farrowing stalls. If round stalls do not fulfill this need, it will not be surprising to

(Turn to page 53)

TABLE 1. Comparison of Pen Versus Stall Farrowing of Sows*

	Pens	Stalls
Number of litters	139	120
Average number born alive	10.6	10.1
Average number weaned, 56 days	8.8	7.9
Per cent mortality	16.9	22.0
Average weight, 56 days	45.0	42.0

*Caldwell, James D., 1960—An evaluation of performance of "Disease-free" pigs in repopulated farm herds. Unpublished Master's thesis. Library, University of Nebraska, Lincoln.

TABLE 2. Effect of Shape of Stall on Farrowing Performance of Sows

	Stall—— Rectangular	Round
Number sows	7*	11†
Number sows which fought stalls	4	0
Number pigs born alive	71	111
Number pigs born dead	7	5
Per cent born dead	9.0	4.3
Number sows needing hormone therapy‡	4	1
Average weaning weight¶	..	..

*One gilt, six sows.

†Two gilts, nine sows.

‡Posterior pituitary extract after farrowing.

¶All pigs were early-weaned, litters were consolidated.

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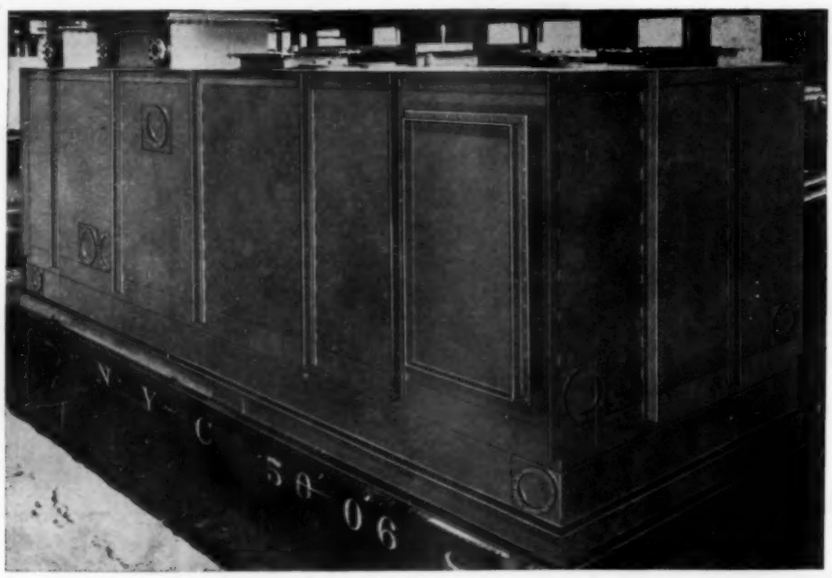

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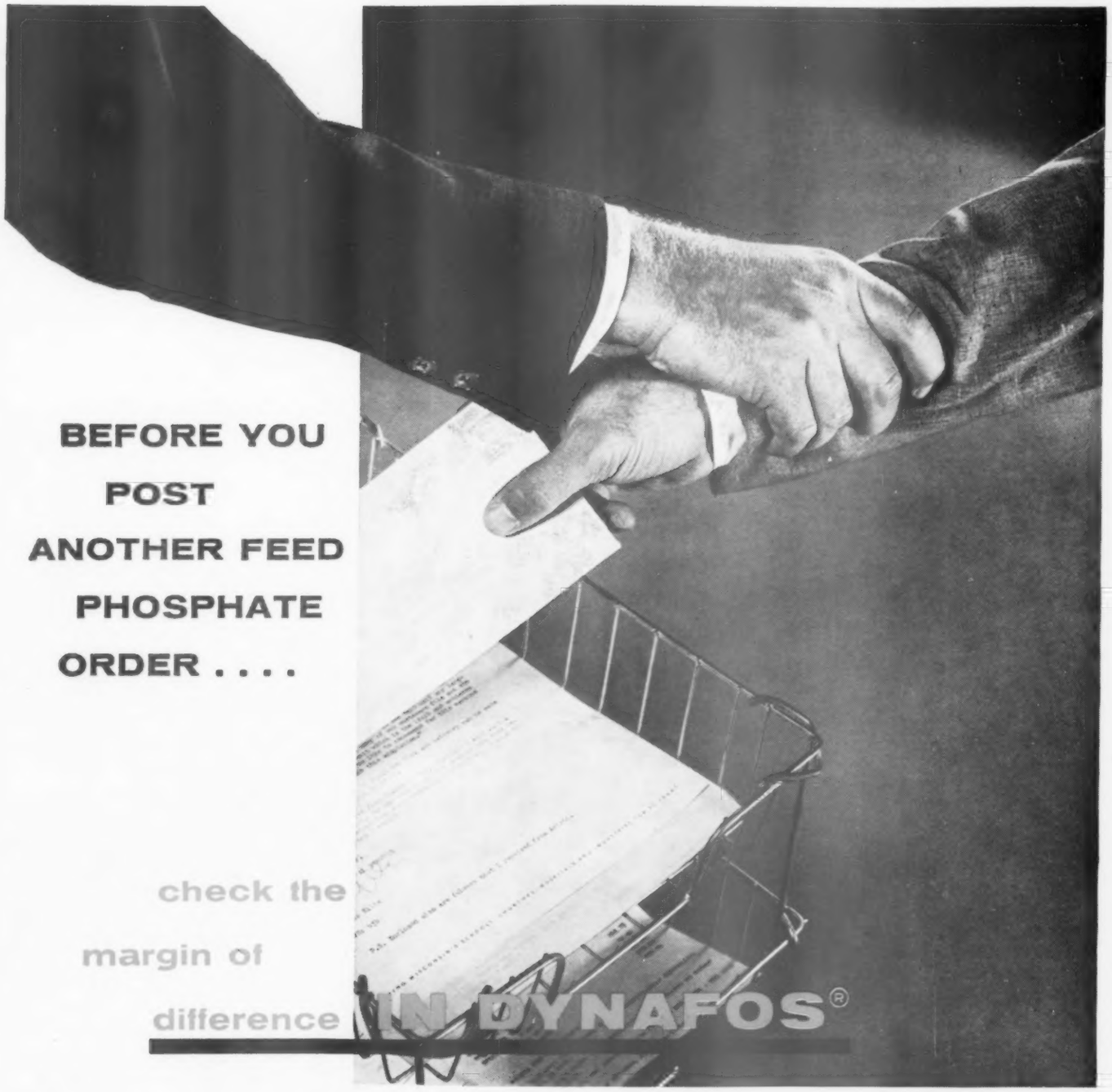

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find many producers returning to pen farrowing."

FEED MIXING—The discussion of feed mixing was presented by Dr. D. B. Hudman of Nebraska.

"Economists estimate that 34 to 75 tons of feed must be processed per year by the swine producer to justify ownership of adequate grinding and mixing equipment," he told swine men. "If extremes in production were considered, the number of sows and their litters would vary from 10 to 30. The feed required for a good sow and her litter to market weight would be about 3½ tons."

Dr. Hudman said that "success in home-mixing" has been brought about by "improvement and development of home-mixing and grinding equipment; use of portable mixers and grinders; development of simple corn-soy rations with a minimum number of ingredients; availability of commercial vitamin, antibiotic and trace mineral mixtures to the producer; improved feed storage and handling facilities so that a producer can buy large volumes of feed and reduce labor in feeding; increased nutritional knowledge for proper supplementation of simple corn-soy rations; increased size of operation."

Dr. Hudman went on to tell farmers that a producer doing home mixing must "know, or have at his disposal, knowledge of formulation or swine nutrition that experts handle with commercial feed companies. The annual cost per ton will have to be weighed against cost of commercial feeds and custom mixing by local dealers. Quite often the comparative cost of commercial feeds and home-mixed feeds will make it impractical to mix your own feeds."

He said farm-mixed rations can be formulated by three main methods—mixing commercial protein supplements with ground grain; mixing or purchasing protein supplement to feed separately with grain; mixing ground grain with protein, minerals, vitamins and additives in a complete feed.

Dr. Hudman said factors other than costs that must be considered in actual operations are numerous. He mentioned efficiency of grinding and mixing, availability of all ingredients and quality of finished feed—plus management ability to recognize capabilities of the feed on commercial vs. home-mixed rations.

The Nebraska scientist went on to outline feeding programs and present information on complete feed and supplement formulation. The feeders were advised that details on the rations and ration modifications are available upon request from the university.

DISEASE-FREE PIGS—The SPF (disease free) pig program in Nebraska has a "bright future, provided the necessary precautions are taken to maintain a disease-free status and that only genetically superior animals are sold as breeding stock." This "situation" was outlined by Leo Lucas, extension animal husbandman at the "Rooters' Days." The special swine days were sponsored by the College of Agriculture and the Nebraska Breeders and Feeders Assn.

Mr. Lucas cited two factors "that seem to hold the future of the SPF program." (1) The ability and desire of producers to follow isolation procedures necessary to prevent disease infections, and (2) the ability of a certification program to function so that only SPF hogs with superior production records and freedom from disease are sold as future breeding stock.

The SPF program, begun with repopulation of the University of Nebraska herd with disease-free pigs about five years ago, has expanded to include commercial application on Nebraska farms. There now are approximately 150 herds in Nebraska with SPF swine, Mr. Lucas stated.

One of the most important items in continuing disease free status of the farm is maintenance of a "closed herd," Mr. Lucas noted. This is accomplished by never bringing swine on the farm unless they originate from either a licensed laboratory as primary SPF stock or from a certified secondary SPF herd.

Records now available indicate three advantages for SPF swine production, Mr. Lucas said, listing them as "eliminating disease and thereby reducing drug bills"; raising more pigs per sow and growing pigs more rapidly on less feed.

Sound breeding, feeding and management are important with SPF hogs, Mr. Lucas commented.

"The SPF program is only another

(Turn to NEBRASKA, page 63)

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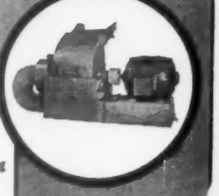
Nearly a Half Century of Service to the Feed Industry
1090 Tenth Avenue S. E. Dept. M Minneapolis 14, Minn.



JACOBSON HAMMERMILLS
AJACS Quick Screen Change
UNIVERSAL Quick Screen Change
AJACS-O-MATIC Remote Screen Change

CK is OK for Profit...Service...Quality

Don't Mix Without CK Econolass

(85% feeding Cane Molasses Equivalent — Dehydrated on Soybean Mill Feed)

Why? Because CK Econolass is economical AND is of uniformly high quality. In fact, you can't buy a better dry blackstrap molasses feed ingredient.

You'll like the ease with which Econolass mixes, and you'll like the convenience of the moisture-resistant 50 lb. bags.

You'll like the FAST service your orders get from CK—and your customers will like the fast, healthy gains your feeds provide with the added palatability of Econolass.

Profits Go Up With Econolass in Your Feed

The CK Line of quality feed ingredients includes —
Econosol — Fish solubles dried on soymeal.
New Econoloc — Soyoil and lecithin carried on soymeal.

CK Processing Company
REDFIELD, IOWA MUSCATINE, IOWA
The Best Friend Your Feed Ever Had

PROTEIN BLOCKS
Also
MINERAL BLOCKS
WRITE FOR PRICES
FARMERS FRIEND MINERAL CO.
NAPOLEON, OHIO

EGGSHELL BRAND
OYSTER SHELL

EGGSHELL BRAND Oyster Shell outsells any other shell or calcium substitute in the Northeast . . . is the preferred product among poultrymen and hens alike.

Pure, soft, clean and dust-free, it is tops in the field for digestibility. And, it goes to work within 6 hours to build the finest egg shells known to man or fowl.

This sales leader is promoted in trade publications and backed by merchandising aids that really do the job.

Follow the Leader!

EGGSHELL BRAND OYSTER SHELL
a product of
OYSTER SHELL CORPORATION
BALTIMORE, MARYLAND

★ Buy and Sell Through WANT ADS ★

CALENDAR FOR 1961-62

FEBRUARY

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Convention Calendar

Feb. 19-21—Midwest Feed Manufacturers Assn.; Hotel Muehlebach, Kansas City, Mo.; executive vice president, Lloyd S. Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Feb. 19-21 — Ohio Grain & Feed Dealers Assn.; Neil House, Columbus; sec., George G. Greenleaf, 5625 N. High St., P.O. Box 121, Worthington.

Feb. 19-21—Colorado Grain, Milling & Feed Dealers Assn.; Hilton Hotel, Denver; sec., R. L. Wier, 519 Boston Bldg., Denver 2.

Feb. 20-21—Midsouth Soybean and Grain Shippers Assn.; Jung Hotel, New Orleans, La.; sec., Paul C. Hughes, Box 658, Blytheville, Ark.

Feb. 22—South Dakota Beef Research Day; South Dakota State College, Brookings; Dr. R. C. Wahlstrom, Animal Husbandry Dept.

Feb. 22—Kentucky Turkey Assn.; University of Kentucky, Lexington; J. E. Humphrey, poultry extension specialist.

Feb. 22—Broiler Housing Symposium; University of Georgia, Athens; Dewey McNiece, Extension Poultry Dept.

Feb. 23—Illinois State Turkey Growers Assn.; University of Illinois, Animal Sciences Laboratory; sec., S. B. Swann, Kauffman Turkey Farms, Waterman, Ill.

Feb. 28-March 1—Virginia Feed and Nutrition Conference; Hotel Roanoke, Roanoke; sec., J. Paul Williams, Virginia State Feed Assn., 615 E. Franklin St., Richmond.

March 1-2—Colorado Livestock Days; March 1, Sheep and Wool School, Swine Day and Beef Producer Day; March 2, Feeders Day; Colorado State University, Fort Collins; chm., E. K. McKellar.

March 1-2 — Poultry Health and Management Short Course; Clemson College, Clemson, S.C.; Dr. F. W. Boebel, Poultry Pathologist.

March 7—Iowa Swine Production Conference; Memorial Union, Iowa State University, Ames; Animal Husbandry Dept.

March 7-8 — Grain Sorghum Research and Utilization Conference; Crystal Ballroom, Herring Hotel, Amarillo, Texas; Grain Sorghum Producers Assn., 322 Petroleum Bldg., Amarillo.

March 8—Mutual Millers & Feed Dealers Assn.; Statler-Hilton Hotel, Buffalo, N.Y.; sec., Mrs. Donald E. Mattison, Box 8, Cattaraugus, N.Y.

March 8 — Distillers Feed Conference; Sheraton Gibson Hotel, Cincin-

(Turn to CALENDAR, page 68)

New Listings

For the convenience of readers who scan the Convention Calendar regularly for new listings, those added to the column in the current week appear separately from ones which have been entered previously. The following week they will be moved to their proper slot where they will remain until the event is held.

Feb. 27—New Mexico Feeders Day; New Mexico State University Experiment Station, University Park; Dr. John H. Knox, chm., Animal Husbandry Dept.

April 20-22 — Beef Cattle Short Course; University of Florida, Gainesville; Dr. T. J. Cunha, head, Animal Husbandry & Nutrition Dept.

June 4-6 — Indiana Grain & Feed Dealers Assn.; French Lick-Sheraton Hotel, French Lick, Ind.; sec., Fred K. Sale, 600 Board of Trade Building, Indianapolis 4.

Wenger's NEW BULK UNLOADER

ENGINEERED TO HANDLE HI-MOLASSES MEAL FEEDS AND HARD PELLETS WITH EQUAL EASE AND GENTLENESS

For the most economical mill to farm service, install the Wenger Unloader on your present truck body and offer your customers satisfying bulk or bagged delivery service.

BUILT BY HI-MOLASSES SPECIALISTS
The same rugged features that contributed to this unloader's reputation as the very best on the market for molasses feeds make it an outstanding buy for handling pellets, grains, and mashes.

May be installed by your own shop or the Wenger factory

Write for information giving dimensions and make of your truck bodies. Wenger can also furnish bodies complete with unloader installed.

Wenger Mixer Manufacturing
SABETHA, KANSAS PHONE AVenue 4-2133

Standard of the Industry for Liquid Feed Mixing, Pelleting and Cooling Equipment.

MILLIONS OF CUSTOMERS READ AND HEAR ABOUT CYANAMID COORDINATED FEED-HEALTH PROGRAM!

Your customers learn how to profit through better animal and poultry health from (1) a 12-page advertisement in February Farm Journal; (2) a 3-page gate-fold in February Progressive Farmer; (3) advertisements in many other national, sectional and state farm papers; and (4) leading farm directors on 40 radio stations.

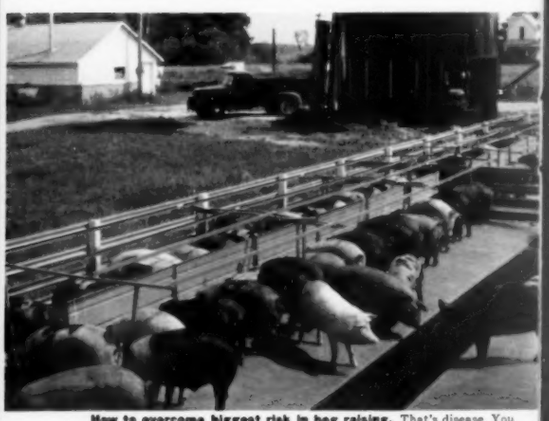
Cover of 12-page advertisement in the national edition of February Farm Journal which more than 3,000,000 farm families will see and read. Reprints of this advertisement are available for distribution to your customers. Other features of the Cyanamid promotion on the Coordinated Feed-Health Program are shown inside . . .

HOW COORDINATED FEED-HEALTH PROGRAMS CAN HELP BUILD FEED SALES VOLUME

Farmers get better results through coordinated use of formula feeds containing Aureomycin, and proper medications. This leads to stronger customer loyalty and satisfaction.

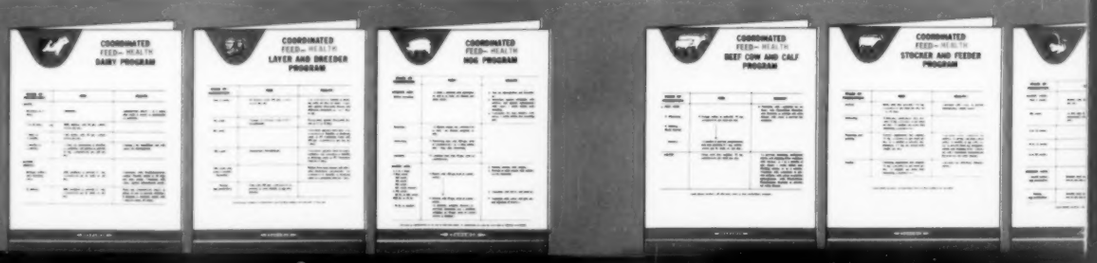
Shown below is a 3-page, gate-fold advertisement on the Coordinated Feed-Health Program which appears in all editions of February PROGRESSIVE FARMER.

How to assure maximum dairy production. A coordinated program with AUREOMYCIN® in formula feeds and Cyanamid vaccines and medications – helps provide better health for calves and cows. Diseases such as scours, respiratory infections, leptospirosis, foot rot and mastitis are controlled. Calves develop soundly – cows maintain the health needed for maximum production.



How to overcome biggest risk in hog raising. That's disease. You keep it out of sows, baby pigs, growing and fattening hogs with AUREOMYCIN in formula feeds and Cyanamid vaccines and medications. Sows stay healthy, raise more pigs. You prevent scours, anemia, hog cholera and erysipelas – maintain weight gains in the presence of atrophic rhinitis – produce more pork.

GET YOUR FREE COORDINATED PROGRAMS


COORDINATED FEED-HEALTH DAIRY PROGRAM
COORDINATED FEED-HEALTH LAYER AND BREEDER PROGRAM
COORDINATED FEED-HEALTH HOG PROGRAM
COORDINATED FEED-HEALTH BEEF COW AND CALF PROGRAM
COORDINATED FEED-HEALTH STOCKER AND FEEDER PROGRAM

Beginning in February, leading farm publications and radio stations throughout the country will launch the story of Cyanamid's Coordinated Feed-Health Program.

Your customers—poultry growers, hog producers, dairymen, cattle and sheep raisers and feeders — will *see* and *hear* about the new, step-by-step programs that deliver a powerful, *double-punch* attack on costly diseases.

They will read about these feed-health programs in special, 4-color advertisements in February Farm Journal and Progressive Farmer—and in other national publications addressed to specific livestock and poultry producers. They will continue to read about the feed-health programs in national, sectional and state farm papers month after month.

They will *hear* about the feed-health programs, beginning in February and continuing throughout the year, on 40 radio stations — as described by well-known radio farm directors.

What is Cyanamid's Coordinated Feed-Health Program?

Briefly, the Cyanamid Coordinated Feed-Health Program is a systematic and organized attack on the disease problems that plague livestock and poultry producers.

Carefully developed recommendations for the coordinated use of formula feeds containing AUREOMYCIN®, and scheduled use of preventive vaccines and medications, work for top health and profits from start to market — and through the entire productive lifetime of livestock or poultry.

What are the advantages to feed manufacturers and dealers?

Farmers who utilize the Coordinated Feed-Health Programs to achieve a higher level of health and production in herds and flocks automatically become better feed customers, using more feeds, more effectively.

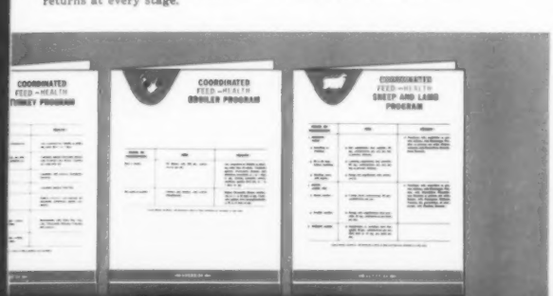
In addition, these programs help establish a stronger relationship between producers and feed dealers — open up a new source of sales and profits for both manufacturers and feed dealers.

If you have not already consulted your Cyanamid representative about the Coordinated Feed-Health Program, do so now. Or write to: American Cyanamid Company, Agricultural Division, New York 20, N. Y. ®*AUREOMYCIN is American Cyanamid Company's trademark for chlortetracycline.*

The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Governments. Always read the labels and carefully follow their directions for use.

How to turn more replacements into profitable producers. Start your chicks on AUREOMYCIN Soluble in drinking water and on potentiated AUREOMYCIN in a starter feed. This will prevent CRD, synovitis, blue comb and coccidiosis. Use Cyanamid vaccines as recommended to prevent Newcastle disease, infectious bronchitis and laryngotracheitis. House more vigorous pullets.

How to produce more beef at less cost. AUREOMYCIN in range cubes, creep feeds, feedlot rations and stress feeds helps prevent scours, respiratory infections, foot rot, liver abscesses and anaplasmosis. Cyanamid vaccines prevent leptospirosis, shipping fever, blackleg, malignant edema, hem-sep and anthrax. This program gives you better returns at every stage.



NEW APPROACH TO HIGHER INCOME— COORDINATED FEED-HEALTH PROGRAMS

Systematic feeding of Aureomycin in formula feeds and use of Cyanamid vaccines and medications help Southern farmers knock out livestock and poultry diseases, make more money

Egg production up 18%. Beef numbers up 21%. Sheep and lamb numbers up 14%. Hogs up 28%. Broilers up 85%.

That's the story of the tremendous gains made in the past five years *alone*, in the states served by this magazine.

This expanding growth places more urgent demands on everyone engaged in livestock and poultry production. It requires more efficient management day-in and day-out to eliminate all unnecessary risks.

Biggest of these risks is *disease*. It can hit hard at any stage of production, smash profits.

How can you *organize* to fight disease and lick it? Do this: follow the Cyanamid Feed-Health Program that applies to your operation and you deliver a *double* knock-out punch against disease.

There's a program especially designed for dairymen, hog producers, poultrymen, turkey growers, beef and sheep raisers. Each program is a carefully coordinated and scheduled step-by-step plan showing you how, by the use of proper feeds with AUREOMYCIN® at each stage of production together with the use of Cyanamid preventative vaccines and medications, you can control most of the diseases that are major economic problems.

A recent test of a specific program developed by Cyanamid clearly indicated, by an unusually heavy response in the form of hundreds of enquiring letters, that farmers strongly feel the need for such coordinated programs and have great, active interest in them.

Look at the illustrations of the eight Cyanamid Feed-Health Programs shown on the opposite page. Choose those that are of most interest to you. Ask your feed man for your free copies, or write direct. Don't gamble with diseases — help prevent them with a coordinated program before they start! American Cyanamid Company, Agricultural Division, New York 20, N. Y.

®AUREOMYCIN is American Cyanamid Company's trademark for chlortetracycline.

The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Governments. Always read the labels and carefully follow their directions for use.

CYANAMID
COORDINATED FEED-HEALTH PROGRAM

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

You have read the highlights of the Cyanamid Coordinated Feed-Health Programs on these pages. You have seen how they can make more money for you. Now . . . act today to get the full details. Ask your feed man for the free, special, step-by-step folder that fits your operation, or write direct to Cyanamid.

THESE COORDINATED FEED-HEALTH PROGRAM ADS WILL BE SELLING FOR YOU MONTH AFTER MONTH

Shown below are reproductions of 5 of the 8 Feed-Health Program ads scheduled for the coming months.

HOW TO TURN MORE REPLACEMENTS INTO PROFITABLE EGG PRODUCERS

Do this: coordinate proper feeding with protective medication through every stage — from baby chicks to laying hens.

You've selected your replacement chicks for breed-in characteristics that should bring you more eggs over a longer period at less cost.

How can you be more certain that those chicks will live up to their potential and make your egg-producing operation an economic success?

By following good management and sanitation practices. By taking every precaution to see that disease is kept out of your flocks all the way through, from chick to laying hen.

Disease, visible or invisible, is the biggest handicap to making more egg money. It can strike suddenly, cause high death losses or severe slumps in production.

The Cyanamid Feed-Health Program—described step-by-step on these pages—shows you what to do to lick disease, when to do it and how to do it. It is a proved program—practical, sound, easy to follow.

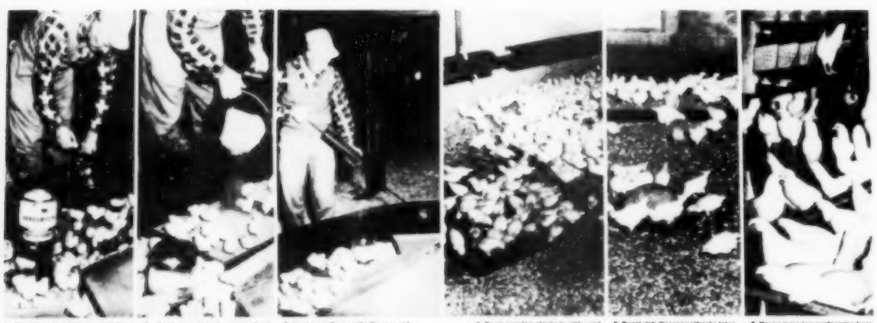
Talk to your feed man. Ask him for your free folder which describes, in detail, the Cyanamid Feed-Health Program for layers and breeders. American Cyanamid Company, Agricultural Division, New York 20, N. Y.

"AUREOMYCIN" is American Cyanamid Company's trademark for chlortetracycline.

The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Control agencies. Always read the labels and carefully follow directions for use.

COORDINATED FEED-HEALTH PROGRAM

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE



1. Give them health in the drinking water. First, immediate step for replacement chicks is AUREOMYCIN* Soluble in the drinking water for first 48 hours. This assures adequate early intake of AUREOMYCIN to guard against CRD, synovitis and blue comb. Give AUREOMYCIN Soluble at other times when disease or stress shows up.

2. Feed potentiated starter feed with Aureomycin. A 10 starter containing 200 grams of AUREOMYCIN per ton is today's most effective feed. Fed for 3 to 4 weeks, this starter feed protects against CRD, synovitis, blue comb and coccidiosis—guards against vaccination reactions—puts chicks off to a fast, vigorous start.

3. Dont keep Newcastle disease and bronchitis. Here's your sure way to control Newcastle disease and infectious bronchitis simultaneously. Use Cyanamid Dust BULATM, or equivalent, on the drooping water, at 1 to 7 days of age. Repeat vaccination at 3 to 4 weeks of age, 12 to 16 weeks of age, and every 4 months thereafter.

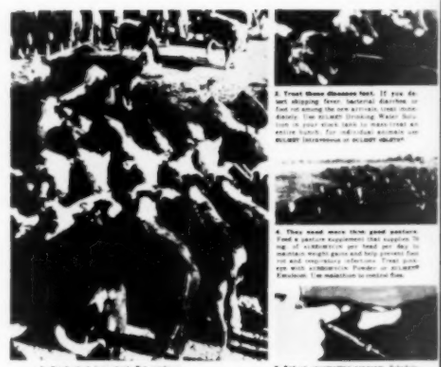
4. Keep growing chicks healthy and vigorous. At 4 weeks of age, change to grower feed with 0.02% Nitrophenide. Feed up to 12 weeks. Nitrophenide will continue to control coccidiosis and allow the development of immunity. If an outbreak occurs after 12 weeks, treat with AUREOMYCIN drinking water solution.

5. Don't risk disease setbacks later. Be prepared with a potentiated treatment feed containing 200 grams of AUREOMYCIN per ton at any time trouble shows up, including coccidiosis outbreaks. AUREOMYCIN is ideal for treatment because it effectively controls CRD, synovitis, blue comb as well as coccidiosis.

6. House more top-performing hens. When you follow this Cyanamid Feed-Health Program, you get more healthy pullets in the laying house. At the first sign of trouble—drop in feed consumption, slump in egg production or other symptoms of disease—use a feed containing AUREOMYCIN. Keep hens producing!

HOW TO STEP-UP PROFITS FROM YOUR STOCKERS AND FEEDERS

This coordinated step-by-step program will help you market more cattle, with better bloom and quality at lower cost, to bring you higher returns.



1. Good start important. Put newly arrived cattle on a good stress feed that provides 350 mg. of AUREOMYCIN per head per day, for up to 30 days, to prevent bacterial pneumonia, shipping fever, bacterial diarrhea, foot rot and secondary infections. Vaccinate with Ultar® to prevent leptospirosis.

4. Treat these diseases fast. If you detect shipping fever, bacterial diarrhea or foot rot among the new arrivals, treat immediately. Use AUREOMYCIN Drinking Water Solution in your stock tank to maximize at early signs, for individuals AUREOMYCIN or AUREOMYCIN Intramuscular or AUREOMYCIN Ointment.

6. They need more than good pasture. Feed a pasture supplement that supplies 70 mg. of AUREOMYCIN per head per day to maintain weight gains and help prevent liver rot and respiratory infections. Treat gain-eye with AUREOMYCIN Powder or AUREOMYCIN Ointment. Use medication to control flies.

8. Set up vaccinating program. Schedule your vaccinations for infectious rhinotracheitis, for pertussis with calfhood,* for leptospiroses with Ultar,* for black leg malignant edema and shipping fever with Ovilar.* Set up water disease with Clostridium Hemolyticum Bacterin.

HOW TO OVERCOME THE BIGGEST RISK TO YOUR HOG INCOME

That risk is disease. This coordinated, feed-health program prevents diseases from causing losses on your farm. It's a practical program! Follow it step by step and you'll see.

Half-way measures are just not enough! Profit producers need to go all out . . . to double or even treble their profits by maximizing the profitable hog operation. This means selecting top-quality, blood-tested breeding stock. It means using good formula feeds, good management, housing and sanitation.

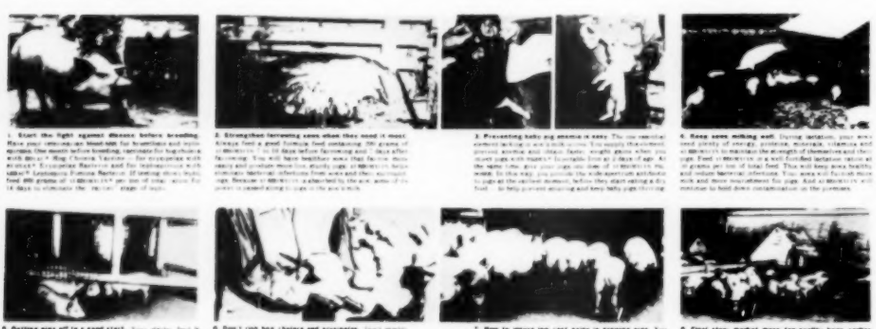
It means getting off those runty pigs and "looking over" the entire herd to spot signs of disease. It means being alert to every disease problem that can hold back your profits.

Disease, visible or invisible, is by far the biggest risk to profitable hog raising. It can attack any of your production stage.

Why gamble? You can lick most diseases before they start by following the coordinated, step-by-step plan shown on these pages.

This feed-health program is practical, easy-to-do and money-making! You can top this powerful double-punch: (1) Good formula feeds and (2) the proper vaccines and medications. It shows you how to make them work together so that disease never gets a foothold in your herd.

Study each important step in this coordinated feed-health program. Discuss it with your feed man. Ask him for a special kit giving down-to-earth, how-to-do-it information on this entire feed-health program. If he doesn't have one, write direct to American Cyanamid Company, Agricultural Division, New York 20, N. Y.

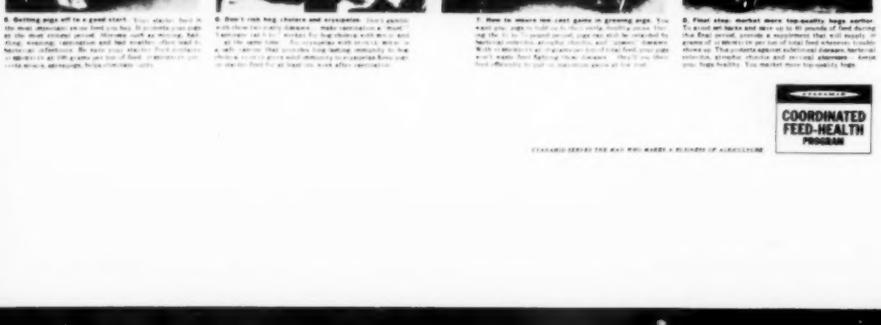


1. Start the fight against disease before breeding. Have your rhinotracheitis blood-test for brucellosis and reproduction (for month before breeding, vaccinate for hog cholera with Serum* Hog Cholera Vaccine—for pneumonias with AUREOMYCIN Soluble Premix and for pathogens with Ultar* Leptospira Pomona Bacterin. If testing shows, feed 400 grams of AUREOMYCIN per ton of ration for 14 days to eliminate the carrier stage of brucellosis.

2. Strengthen farrowing sows when they need it most. Always feed a good formula feed containing 200 grams of AUREOMYCIN per ton for 10 days before farrowing and 7 days after farrowing. You will have healthier sows that farrow more easily and produce more live, sturdy pigs. AUREOMYCIN helps eliminate bacterial infections from sows and their nursing pigs. Because of AUREOMYCIN's absorption by the sow, some of its protective qualities pass to the pigs in the milk.

3. Preventing baby pig anemia is easy. The one essential element lacking in sow's milk is iron. You supply this element, prevent anemia and obtain faster, weight gains when you inject pigs with iron.* Inject only from 3 to 7 days of age. At the same time, give pigs their first dose of AUREOMYCIN Premix. In this way, you provide the wide-spectrum antibiotic to pigs at the earliest moment, before they start eating a dry feed . . . to help prevent scouring and keep baby pigs thriving.

4. Keep sows milking well. During lactation, your sows need plenty of energy, protein, minerals, vitamins and an adequate supply of AUREOMYCIN to maintain the strength of themselves and their pigs. Feed AUREOMYCIN as well fortified lactation ration at 10 grams per ton of total feed. This will keep sows healthy and reduce bacterial infections. Your sows will furnish more milk and more nourishment for pigs. And as AUREOMYCIN will continue to feed down contamination on the premises.



5. Getting pigs off to a good start. Your starter feed is the most important one you feed. It is during your pigs' first month of life that they are most subject to setbacks from scours, pneumonia, bacterial infections. Be sure your starter feed contains AUREOMYCIN at 100 grams per ton of feed. It minimizes scours, pneumonia, helps eliminate runts.

6. Don't risk hog cholera and erysipelas. Don't gamble with these two costly diseases. Make vaccination a must. Vaccinate pigs for hog cholera with Serum and Virus* at the same time. For erysipelas with Serum alone, a safe, serum that provides long-lasting immunity to hog cholera, or use a germ-killed bacterin to vaccinate pigs over the feed five at least one week after vaccination.

7. How to insure low cost gains in growing pigs. You want your pigs to hold to their early healthy growth rate during the 70 to 75 pound period. pigs are hit by setbacks by bacterial infections, atrophic rhinitis, and internal diseases. With AUREOMYCIN at 100 grams per ton of feed, your pigs will resist these fast-fighting these diseases. They'll use their feed efficiently for fast, economical gains all the way.

8. Finish step: market more top-quality hogs earlier. To avoid set backs and save up to 40 pounds of feed during the final period, provide a supplement that will supply 10 grams of AUREOMYCIN per ton of total feed whenever trouble shows up. This checks spread of bacterial diseases, bacterial enteritis, atrophic rhinitis and minimal stunting. Keep your hogs healthy. You market more top-quality hogs.

COORDINATED FEED-HEALTH PROGRAM

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

HOW TO RAISE MORE QUALITY CALVES THAT BUYERS PREFER

Increase your chances of a bigger calf crop and grumbly market calves by following this Feed-Health Program with Aureomycin in formula feeds, and Cyanamid vaccines.

1. How to get more strong, healthy calves. Feed range cows containing AUREOMYCIN to reducing disease. Cows stay healthier, are able to drop sturdy calves. Vaccinate your herd with Cyanamid* for pinkeye, with Clostridium Hemolyticum Bacterin to prevent red water disease, with Ultar* to prevent leptospirosis.

4. Creep feed Aureomycin for low-cost gains. Soon after calves are born, put them on creep feeds that provide 70 mg. of AUREOMYCIN per head per day. This gives calves stamina to resist disease, helps prevent stress and foot rot, produces calves through summer, assures big calves with extra weight and bloom.

6. Vaccinate to prevent these costly diseases. To prevent blacks, malignant edema and shipping fever, vaccinate calves with Ovilar* at 4 to 6 month of age; with Cutivax to prevent anthrax, with Ultar* to prevent leptospirosis, with Clostridium Hemolyticum Bacterin to prevent red water disease.

Farm papers that carry the Coordinated Feed-Health Program

American Agriculturist
American Livestock Journal
Arizona Farmer-Ranchman
Broiler Business
Broiler Industry
Broiler Journal
California Farmer
California Livestock News
Cattle Guard
Colorado Rancher & Farmer
Corn Belt Farm Dailies
Dairy Breed Group
Dairy Plant Fieldman
Egg Producer
Everybody's Poultry Magazine
Farm Journal
Farmer Stockman
Feedlot
Hoard's Dairyman
Idaho Farmer
Midwest Farm Unit:
(1) The Farmer
(2) Nebraska Farmer
(3) Prairie Farmer
(4) Wallace's Farmer
(5) Wisconsin Agriculturist
Michigan Farmer
Missouri Ruralist
Montana Farmer-Stockman
National Hog Farmer
National Livestock Producer
National Wool Grower
New Jersey Farm & Garden
Ohio Farmer
The Poultryman
Poultry Tribune
Pennsylvania Farmer
Progressive Farmer
Rural Gravure
Rural New Yorker
Record Stockman
Successful Farming
Sheep Breeder & Sheepman
Sheep & Goat Raiser
Southern Planter
Turkey Producer
Turkey World
Washington Farmer
Weekly Star Farmer
Western Dairy Journal
Western Livestock Journal

HIGH LIFETIME HEALTH LEVEL ESSENTIAL FOR TOP PRODUCTION

From new-born calf through the entire productive lifetime of the cow, this Coordinated Feed-Health Program builds and maintains the good health that results in maximum production

Trade and Consumer advertising soon will appear in livestock publications on a coordinated program to systematize disease prevention.

The role of the veterinarian as an indispensable team member in such a program will be highlighted.

Livestock and Industry people will be told over and over that the veterinarian is essential in any program aimed at better livestock health. You are the key man.

Veterinary Professional Service Department
American Cyanamid Company
New York 20, New York

VETERINARY

Professional Veterinary Journals will carry this and similar ads on the Coordinated Feed-Health Programs throughout the year.

CUSTOMERS HEAR 40 RADIO FARM DIRECTORS TELL THE BENEFITS OF CYANAMID'S COORDINATED FEED-HEALTH PROGRAM

These radio farm directors know *what's going on* in their areas. They know who's raising what type of animal or bird — and under what conditions.

They'll pinpoint the Cyanamid Coordinated Feed-Health Programs to suit the business your customers are in—talk about stresses, diseases and vaccination programs at the right times.

They'll be working for you week after week, season after season — helping you build sales.

Alden Aaroe, WRVA
Richmond, Virginia

Bill Alford, WMT
Cedar Rapids, Iowa

Wally Ausley, WPTF
Raleigh, North Carolina

Ted Capener, KSL
Salt Lake City, Utah

Grady Cole, WBT
Charlotte, North Carolina

Dewey Compton, KTRH
Houston, Texas

Jack Crowner, WAVE
Louisville, Kentucky

Jack Dillard, KWKH
Shreveport, Louisiana

Deacon Doubleday, WSYR
Syracuse, New York

Wally Erickson, KFRE
Fresno, California

Hugh Ferguson, WCAU
Philadelphia, Pennsylvania

Jay Gould, WOWO
Fort Wayne, Indiana

Jack Gowing, KMA
Shenandoah, Iowa

Roy Gumtow, WKOW
Madison, Wisconsin

George Haefner, WHAM
Rochester, New York

Lyle Hansen, WNAX
Yankton, South Dakota

Clyde Keathley, WRFD
Worthington, Ohio

Larry Kirk, KFKA
Greeley, Colorado

Keith Kirkpatrick, WHO
Des Moines, Iowa

Jack Kreck, WDAF
Kansas City, Missouri

Wilbur Levering, WIBW
Topeka, Kansas

George Logan, WLW
Mason, Ohio

Ted Mangner, KMOX
St. Louis, Missouri

Bill Mason, WBBM
Chicago, Illinois

Andrew McCaskey, WSVA
Harrisonburg, Virginia

Nelson McIninch, KNX
Los Angeles, California

Carl Meyerdirk, KVOO
Tulsa, Oklahoma

Jack Morrow, WIBC
Indianapolis, Indiana

Chuck Muller, KOA
Denver, Colorado

Arnold Peterson, WOW
Omaha, Nebraska

Russell Pierson, WKY
Oklahoma City, Oklahoma

Calvin Pigg, WBAP
Ft. Worth, Texas

Conway Robinson, WBAL
Baltimore, Maryland

George Roesner, KPRC
Houston, Texas

George Shannon, WWL
New Orleans, Louisiana

Cotton John Smith, KGNC
Amarillo, Texas

Maynard Speece, WCCO
Minneapolis, Minnesota

Les Sturmer, WBAY
Green Bay, Wisconsin

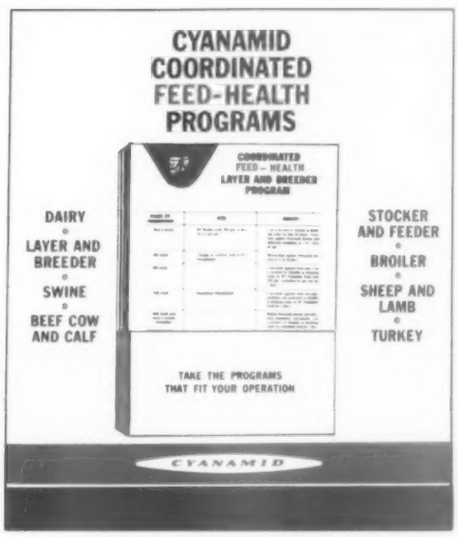
Marvin Vines, KTHS
Little Rock, Arkansas

Jim McDonald, WSM
Nashville, Tennessee

ALL THESE SALES AIDS HELP YOU PROMOTE COORDINATED FEED-HEALTH PROGRAMS

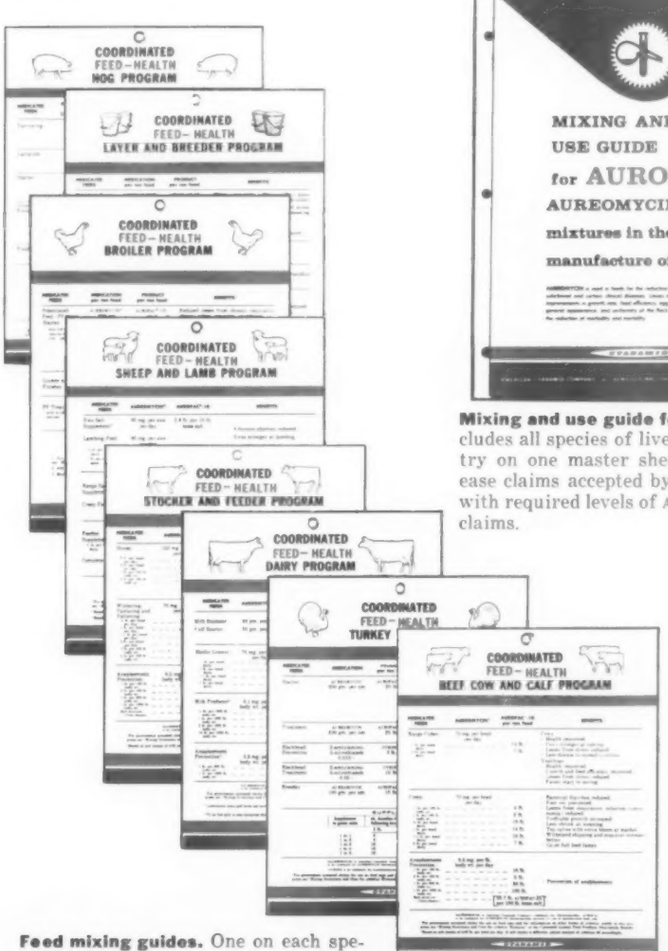
Materials shown on this page are for feed manufacturers and dealers.

Brochure on Coordinated Feed-Health Program. Explains benefits to consumers, feed manufacturers and feed dealers.



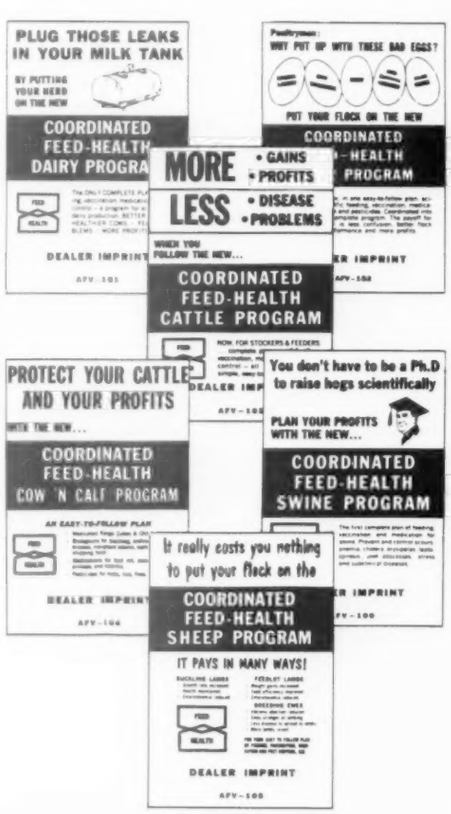
Counter card program dispenser. Available on request.

Two new mailing pieces for the industry (1) Feed-Health Digest. Gives industry news, facts on feeding and on control of diseases, answers to feeding problems. (2) Feed-Health Supplement. Gives up-to-the-minute merchandising hints.


COORDINATED FEED-HEALTH HOG PROGRAM
COORDINATED FEED-HEALTH LAYER AND BREEDER PROGRAM
COORDINATED FEED-HEALTH BROILER PROGRAM
COORDINATED FEED-HEALTH SHEEP AND LAMB PROGRAM
COORDINATED FEED-HEALTH STOCKER AND FEEDER PROGRAM
COORDINATED FEED-HEALTH DAIRY PROGRAM
COORDINATED FEED-HEALTH TURKEY
COORDINATED FEED-HEALTH BEEF COW AND CALF PROGRAM

Feed mixing guides. One on each species. Tailored to fit feed-health programs. Each shows levels of AUREOMYCIN to be used for each type of feed and the recommended medication.

Mixing and use guide for Aurofac. Includes all species of livestock and poultry on one master sheet. It lists disease claims accepted by FDA together with required levels of AUROFAC to meet claims.

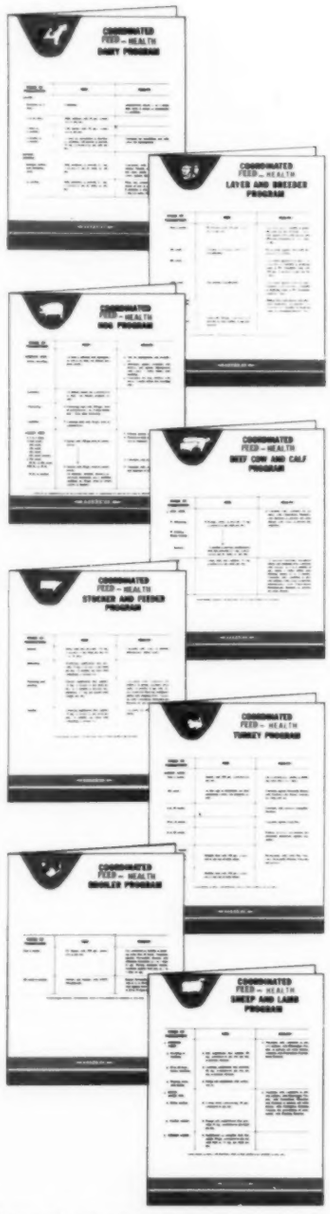

PLUG THOSE LEAKS IN YOUR MILK TANK
COORDINATED FEED-HEALTH DAIRY PROGRAM
MORE • GAINS • PROFITS
LESS • DISEASE • PROBLEMS
WHEN YOU FOLLOW THE NEW...
COORDINATED FEED-HEALTH CATTLE PROGRAM
PROTECT YOUR CATTLE AND YOUR PROFITS
COORDINATED FEED-HEALTH COW 'N CALF PROGRAM
You don't have to be a Ph.D to raise hogs scientifically
PLAN YOUR PROFITS WITH THE NEW...
COORDINATED FEED-HEALTH SWINE PROGRAM
It really costs you nothing to put your flock on the
COORDINATED FEED-HEALTH SHEEP PROGRAM
IT PAYS IN MANY WAYS!
DEALER IMPRINT

Newspaper mats and radio announcements. These are examples of dealer mats already prepared and ready for your use in promoting feed-health programs. Spot radio announcements are also available.

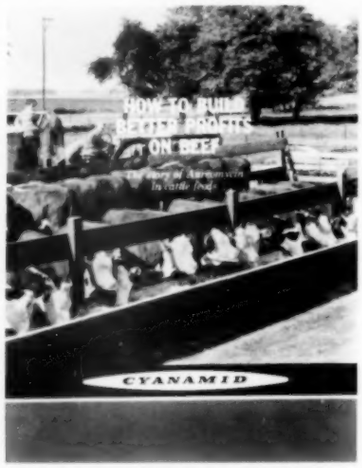
MORE SALES AIDS TO KEEP MORE CUSTOMERS COMING TO YOU

Items shown on this page are for distribution by feed manufacturers and dealers to consumers.

Advertising reprints. Reprints of Cyanamid 4-color ads and special program ads are available for distribution to customers at feed stores or through mailings.

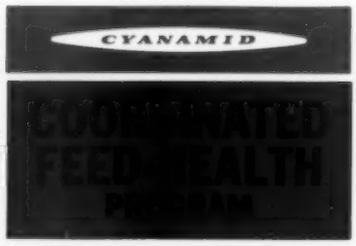


8 specific feed-health programs. Special folders on dairy, hogs, broilers, layers and breeders, beef cow-calf, beef stocker and feeder, turkeys, sheep. Each describes a step-by-step feed-health program.



Hog and cattle books. "How to Produce Pork at Less Cost" and "How to Build Better Profits on Beef" are examples of the quantity of booklets and leaflets available to feed manufacturers and dealers for the promotion of formula feed sales.

American Cyanamid Company
Agricultural Division
New York 20, N. Y.



CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

NEBRASKA

(Continued from page 53)

tool which the producer can use in combination with already well-established principles of swine production," the specialist warned.

FACILITIES—E. A. Olson, agricultural engineer, said adequate buildings and equipment are a major factor in profitable pork production.

"These units must be functionally arranged to save labor, be economical to build and provide an environment that will permit the highest net return to the operator."

The trend to confinement systems for raising swine has resulted in farrowing throughout the year, without regard to weather conditions. This method of production has dictated the incorporation of many new features in swine housing, Mr. Olson noted. These include floor heating systems, wall and ceiling insulation, ventilation systems and other labor saving features.

Mr. Olson called attention to new plans for swine housing facilities now available through the college. Also ready for distribution is a 56-page swine equipment plans book.

With Bemis 44 Years, W. J. Geimer Retires

MINNEAPOLIS—William J. Geimer, manager of the Bemis Bro. Bag Co.'s packaging service in Minneapolis for the past 15 years, has retired from the company. He was succeeded by Robert J. McDonald who, last October, was appointed assistant manager of the plant, which manufactures bag filling, closing and conveying equipment.

W. J. Geimer

The retiring official has been with Bemis for 44 years, joining the company in 1916 as a clerk in its Kansas City office. In 1919, he moved to the Minneapolis plant and two years later became a salesman in the Minneapolis sales office. He was made manager of the Deltaseal department in 1931 and was named the first manager of the company's packaging service in 1945.

North Carolina Reports Feed Tonnage Increase

RALEIGH, N.C.—Commercial feed tonnage shipments in North Carolina during December, 1960, totaled 151,056 tons compared with 115,357 tons shipped in December, 1959, according to L. Y. Ballentine, commissioner, department of agriculture.

The December, 1960, figure brings total commercial feed tonnage shipments for the first six months of the 1960-61 fiscal year to 870,766 tons compared with 745,623 tons a year earlier, reports Mr. Ballentine.

GRAIN MAN DIES

INDIANAPOLIS—Fred W. Scholl, Sr., 80, owner of the F. W. Scholl Grain Co., died in his home here recently. Born at Louisville, Mr. Scholl moved to Indianapolis in 1916 and since had headed the grain merchandising firm in the Board of Trade Building.

Scotch O'Lass
CRUMBLES
THE DRY MOLASSES PRODUCT . . . YOU BUY WITH CONFIDENCE AND SELL WITH PRIDE.
FOR MIXING • TOP DRESSING
CATTLE, DAIRY, SWINE AND POULTRY RATIONS
VYLACTOS LABORATORIES
1901 E. EUCLID DES MOINES 13, IOWA

THE PF KRAFTPACKER

lets you package cattle cubes like these
AND ALL OTHER TYPES OF PELLETED FEEDS
with an accuracy of 4 oz. + or –
WITHOUT CRUMBLING
WITHOUT BREAKING

The Kraftpacker is the most versatile, most accurate high speed automatic packer in its price class. Standard models for 25 lb. to 100 lb. bags—and for 50 lb. to 200 lb. Special models for special uses.

Hundreds of Kraftpackers are giving excellent service in 31 states and many foreign countries.

We'll send you a brochure, of course . . . write Dept. PF61 . . . better yet, why not ask us to arrange for a free demonstration?

Exclusive Sales Agents
The KRAFT BAG Div.
of St. Marys Kraft Corp., Subsidiary of
GILMAN PAPER COMPANY
630 FIFTH AVENUE, NEW YORK 20, NEW YORK
400 W. MADISON STREET, CHICAGO 6, ILLINOIS

If your product can be packaged in a multiwall bag — we'll make the Kraftpacker to fill your bags — and we'll make the bags to fit your product! Our new 300,000 sq. ft. bag plant, close to our integrated paper mill, is equipped to produce every kind of multiwall bag used in feed packaging today!

☐ We are interested in your Kraftpacker.
☐ We are interested in improving our bag.

COMPANY NAME
ADDRESS
CITY ZONE STATE
PRINCIPAL
PRODUCT MFD.

CAN CAN BE CURED

More than one million Americans are living proof. Remember . . . your contributions helped save many of these lives. Your continuing contributions are needed to help discover new cures and, ultimately, the prevention of cancer itself • Remember, too, if you delay seeing your physician, you drastically cut your chances of cure. Annual checkups are the best way of detecting cancer in time • Guard your family! Fight cancer with a checkup and a check.
AMERICAN CANCER SOCIETY

Report on Hy-Line PRECISION GENETICS

How research "fixes" all-around quality in Hy-Line eggs

Opening his mail one morning, an eastern Hy-Line hatcheryman read the following letter from a New Jersey egg buyer: "Packing as I do, thousands of cases of eggs a week," the writer said, ". . . I can safely say that if I had to settle on one kind of bird for all-around excellence of egg quality, that bird would be the Hy-Line."

"To me, as a practical man," the letter continued, "egg quality is made up of many factors: freedom from tints, freedom from blood and meat spots, good shell strength, good shell texture, desirable shape, uniformity of size and shape, large size, firm albumens, and good keeping qualities."

The egg buyer concluded: "While not perfect in every respect, the Hy-Line egg comes closer to what I want than eggs from any other chicken I know about."

That egg buyer—like egg wholesalers and consumers throughout the U. S.—looks for *all-around* quality in an egg. And that is precisely what Hy-Line scientists work to achieve. As H. B. Wallace, general manager of Hy-Line Poultry Farms, puts it: "I consider 'egg quality' a broad term to describe the egg in *all* of the respects which influence its favorable acceptance by the consumer."

The superior all-around quality of Hy-Line eggs is the direct result of Hy-Line Precision Genetics—which we think is the most exacting breeding program in the poultry industry.

In a constant effort to further improve egg quality, Hy-Line scientists break out 200,000 eggs each year. They measure albumen thickness in relation to egg weight (Haugh units). They check for blood and meat spots. They observe the shell for strength, texture, checks and cracks. Before breaking the eggs, they score them for shape, size and color. Birds which do not meet rigid Hy-Line egg quality standards are discarded.

With the aid of the latest genetic tools, desired egg quality traits are purified in inbred lines. These tools include *blood grouping*, which makes it possible to develop inbred lines more precisely than ever before. And a massive testing program, which measures the "combining ability" of inbred lines.

The result of the Hy-Line Precision Genetics program is an outstanding Hy-Line bird capable of producing eggs uniformly good and appealing to the homemaker.

Hy-Line® CHICKS

Hy-Line is a registered trademark of Pioneer Hi-Bred Corn Co. © 1961

F-8 Des Moines, Iowa

STORAGE—Sumner (Iowa) Grain & Feed, Inc., stores 116,000 bu. of government grain in this 50 x 160 ft. structure. A 20 x 50 ft. area within the building is used to store feed and related supplies.

Iowa Firm Caters to Specific Feed Needs

By Al P. Nelson
Feedstuffs Special Writer

Every community has its own specific feed needs and the wise feed man fashions his merchandising policy to meet those needs.

In the case of the Sumner (Iowa) Grain & Feed, Inc., the management, when the firm opened for business two years ago, found that there was a considerable demand for cracked corn by turkey growers, layer flocks and beef raisers. Therefore, the firm installed a large size Letz corn cracker and it has been kept busy most of the time.

Erwin Keding, manager, reports that the feed firm supplies feed for about 200,000 turkeys in this area. The firm cracks about 157,000 bu. of corn annually, and much of it goes to turkey growers who have from 2,500 birds and up.

"We've got corn storage for about 5,300 bu. in three Butler steel tanks," says Mr. Keding, "and we grind out of them. The Letz grinder is out in the open with a canopy over it. We have a Vac-u-vator for lifting grain in and out of the storage tanks."

Mr. Keding also reports that beef raisers buy a lot of cracked corn from Sumner Grain, plus concentrates. Many of the beef men have from 100 to 500 head of cattle. Chicken customers have flocks of 500 to 7,000 hens, says Mr. Keding. These raisers also buy lots of cracked corn.

"In other words, our cracked corn service is really a lead-in service which helps us to sell Nutrena concentrates and also complete feeds," he said.

To facilitate deliveries of cracked corn and complete feeds, Sumner Grain & Feed, Inc., has a 2-ton Grain-O-Vator truck. It is used to pick up grain at farms or elsewhere and also to deliver back to the farm cracked corn, complete feeds, concentrates, etc.

Service Area

"Most of our bulk deliveries are within 20 miles," says Mr. Keding, "but we have one customer 85 miles distant whom we serve. He buys a lot of corn and feeds from us."

A big steel warehouse, 50 x 160 ft., is used to store feed and other supplies in an area 20 x 50 ft. The rest is utilized for the storage of 116,000 bu. of government grain.

"We are planning the addition of a small package feed mill in the front part of this building," states Mr. Keding. "And then we'll be able to custom mix as well as continue our profitable corn cracking operation. The two services should tie in very well."

The company has a 4½-acre tract of land on an important highway. Mr. Keding points out that this is adequate for considerable future expansion. A small modern office and scale house is located near the big storage building.

"We also build volume by selling Ris-Van liquid fertilizer," he says. "We've got two storage tanks with a capacity of 2,500 gal. and can supply farmers' tanks holding 300 to 500 gal." Or the firm will also apply the liquid fertilizer if customers wish.

Sumner Grain & Feed, Inc., also sells and applies anhydrous ammonia. It has three five-row anhydrous ap-

(Turn to **IOWA FIRM**, page 70)

CORN CRACKING—The Sumner (Iowa) Grain & Feed, Inc., uses the facilities pictured here to crack about 157,000 bu. of corn annually. Photo shows three Butler storage bins with 5,300 bu. total capacity and cracking equipment located between two bins in foreground.

WATER MEDICATION
Becomes An Exact Science...
with

PRE-MEASURED PACKETS THAT PROVIDE EXACT DOSAGES . . . AND ADMINISTERED AUTOMATICALLY.

Water medication becomes an exact science when Vineland CROWN-PAK MEDICATIONS team up with the new Vinelab CROWN PROPORTIONER. Better yet, they emancipate the feedman from one of his most vexing problems—the preparation and bagging of special feed mixes for flock medication, and the registration of special feeds. This is the product of choice for the treatment of Capillaria worms in poultry.

Water medication brings a quick response from ailing flocks, and treatment can begin and end exactly as needed. Drug waste is curtailed. Relieves the feedman of medication responsibility.

CROWN-PAK medications are pre-measured soluble powders, packed in plastic packets, and designed for use with the CROWN PROPORTIONER. Simply pour the entire contents of one package into the required amount of water and stir. Drop the "feeder tube" of the Crown Proportioner into the solution and the flock is under treatment.

The Crown Proportioner blends precisely one ounce of concentrated medications, chemical or vaccine with every gallon of drinking water without pumps, motors or electricity. Operates on water pressure alone.

CROWN PAK MEDICATIONS INCLUDE VITAMINS, ANTIBIOTICS, CHEMICALS AND OTHER SPECIAL DRUGS TO MEET EVERY POULTRY DISEASE NEED.

Write Today for Your Free Copy of Our New Illustrated Folders

VINELAND POULTRY LABORATORIES

VINELAND
NEW JERSEY

VIPOL

WEST COAST BRANCH
4068 Broadway Place
Los Angeles, Calif.

Now in commercial use by farmers, SILOTRACIN proves to be low-cost silage insurance

Thousands of satisfied users report Silotracin, new silage preservative with antibiotic action, prevents spoilage–protects valuable proteins–stops offensive odors.

First, Silotracin was tested for several seasons in college field trials. Now this silage preservative has gone through one year of commercial use. The farm reports are in. The reports prove Silotracin to be effective, low-cost silage insurance. Because of its selective antibiotic action, Silotracin eliminates guesswork. It reduces shrinkage, minimizes spoilage and loss of nutrients. It stops offensive odors. Farmers report Silotracin delivers these important advantages:

1 – No antibiotic residue in the silage – none can appear in the milk. The antibiotic disappears before the silage is fed. In fact, laboratory trials have shown that no antibiotic residues are encountered in the milk or meat even when many times the level of Silotracin needed for preservation was fed to cows. FDA clearance is not required for Silotracin. However, it is necessary to register feed tags with U.S.D.A.

2 – Ends offensive odor. Offensive odor, caused by butyric acid, is eliminated when Silotracin is used. Silotracin results in sweeter-smelling silage. And Silotracin, by insuring the right acid conditions, practically eliminates surface spoilage – often a major factor in bunker or trench silos with their large surface areas.

3 – Improves protein digestibility, lowers ammonia production. College tests with cattle and sheep have shown that Silotracin significantly increases protein digestibility. Digestibility was also improved for nutrients other than protein. Because less nitrogen escapes as ammonia in Silotracin-preserved silage, silage from farms was found to have greater protein content.

4 – Easy to handle. Farmers reported Silotracin was easy to handle – did not irritate the eyes, nose, or throat. That's because Silotracin does not produce highly-corrosive sulphur dioxide. It can't harm blowers, choppers, or the silo itself. Silotracin is easy on equipment, easy on the person who handles the silage.

5 – Silotracin preserves nutrients. The farm reports indicated that Silotracin preserved the nutrients in grass and legumes over a wide range of harvesting and storage conditions – in all types of silos. It reduced spoilage and shrinkage, made silage more profitable. All in all, it took the guesswork out of silage making.

WHY SILOTRACIN IS NEEDED

Unfortunately silage cannot always be made under ideal conditions. The selective antibiotic action of Silotracin controls the bacteria until the desirable types grow and predominate in silage made under less than ideal conditions.

Silage treated with Silotracin has more of the "preserving" organic acids (lactic, acetic, propionic) needed for high-quality silage. Butyric acid, with its very offensive odor, is found in very small quantities in Silotracin-treated silage. The table below shows the results reported by scientists from Louisiana.

Comparison of Organic Acids in Silage Preserved With Different Preservatives

Rusoff, LSU

White Dutch Clover

Treatment	pH	Lactic %	Acetic %	Propionic %	Butyric %	Total Desirable Acids %
Silotracin	4.4	3.2	2.6	0.6	0.8	6.4
Control	5.3	1.3	1.3	0.2	1.9	2.8
Molasses	4.8	2.8	1.8	0.6	1.3	5.2
Metabisulfite	4.4	2.9	2.8	0.5	0.9	6.2

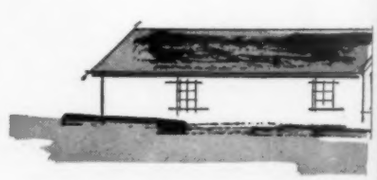
THOROUGHLY TESTED

After a full year of use in thousands of silos, Silotracin has proven successful. It has also been thoroughly tested in the laboratory and in college field trials for several years. Both farm experience and scientific testing have shown that Silotracin consistently makes good silage in any type of silo –upright, bunker or trench. In each case the Silotracin-treated silage was in excellent condition.

SAFE TO HANDLE

Because it relies on antibiotic action, Silotracin contains no chemicals that produce highly corrosive sulphur dioxide. It therefore will not irritate the eyes, skin, nose or throat.

This noncorrosive quality also makes Silotractin easy to handle. It won't harm blowers, choppers, or the silo itself.



NO ANTIBIOTIC RESIDUE

The antibiotic in Silotracin – specially processed zinc bacitracin – disappears *before* the silage is fed. However, just to be sure that a silo opened very early would also provide safe roughage, the following test was conducted. Enough Silotracin was placed in feed to equal what would be found in 30, 60 or 120 pounds of freshly cut forage. This was then fed directly to six dairy cows, three Holsteins and three Jerseys. The milk was checked each day during a 10-day feeding period. Not a trace of antibiotic activity was detected! The reason? Zinc bacitracin is not absorbed by an animal's system!

Test for Antibiotic Residue in Milk – 1960

Breed	Silotracin Zinc Bacitracin fed milligrams per day	*Amount treated silage needed to provide this quantity antibiotic	Amount antibiotic in milk
Holstein	75	30 lb.	None
Holstein	150	60 lb.	None
Holstein	300	120 lb.	None
Jersey	75	30 lb.	None
Jersey	150	60 lb.	None
Jersey	300	120 lb.	None

*Note: These are the amounts of fresh-cut forage treated with recommended levels of Silotracin necessary to provide the amount of antibiotic that was actually fed in this test.

BETTER PROTEIN UTILIZATION

That Silotracin improves protein utilization is shown in three ways: *First,* it reduces ammonia production in the silo. Silotracin, through selective inhibition of protein-destroying bacteria, reduces ammonia production, thereby conserving valuable proteins. *Second,* Silotracin-treated silage is higher in protein. College reports of protein analyses of treated and control silage are shown below for three types of forage material.

PROTEIN CONTENT OF SILAGE
(Dry Matter Basis)

College	Type of Silage	Percent Protein	
		Control	Silotracin
U. of Fla.	Pearl Millet	6.9	8.2
VPI	Alfalfa-Orchard Grass	5.0	6.3
U. of Fla.	Oat	15.1	17.2

Third, the protein in Silotracin-protected silage has been shown to be significantly more digestible than protein in the control silage. The following table gives the results obtained by scientists at the University of Florida from digestibility trials using beef cattle, dairy cattle and sheep.

SILAGE PROTEIN DIGESTIBILITY
Univ. of Florida

Species	Type of Silage	Percent Digestibility		Increase from Silotracin
		Silotracin	Control	
*Beef	Oat	61.0	50.2	10.8
**Dairy	Pearl Millet	76.9	74.2	2.7
*Sheep	Oat	63.1	54.9	8.2
*Sheep	White Dutch Clover	45.1	41.6	3.5

*Davis and McCall – 1960 **Wing and Wilcox – 1960

WHAT USERS OF SILOTRACIN HAVE TO SAY

1 – "The Silotracin silage was accepted immediately; the control silage was refused by all the heifers for four days, and by some for six days."

2 – "Steers consumed almost twice as much silage preserved with Silotracin as the other silages."

3 – "This is the most palatable silage we have ever fed."

4 – "There is a marked preference for the Silotracin-preserved silage, which is reflected in terms of consumption figures."

5 – "The silage has a mild, pleasant odor."

6 – "There is a total absence of putrid silage and of the sharply acid odor, common in silages of this type."

Silotracin is easy to use and attractively priced

It's added directly to forage by blowing in at the silo or chopper. It can also be broadcast by hand directly on the wagon. You can sell this new antibiotic silage preservative profitably at a price most attractive to your customers and competitive with all other products on the market today, new or old!

How Silotracin is Marketed

Siloracin is available only to feed manufacturers in two forms;

a.) Silotracin Ready-to-Use–containing 1 gram specially processed zinc bacitracin antibiotic per pound.

b.) Silotracin Concentrate – containing 40 grams specially processed zinc bacitracin antibiotic per pound.

The concentrate is produced for feed manufacturers who wish to blend and package their own ready-to-use silage preservative.

Both products are shipped in 50 pound multiwall paper bags.

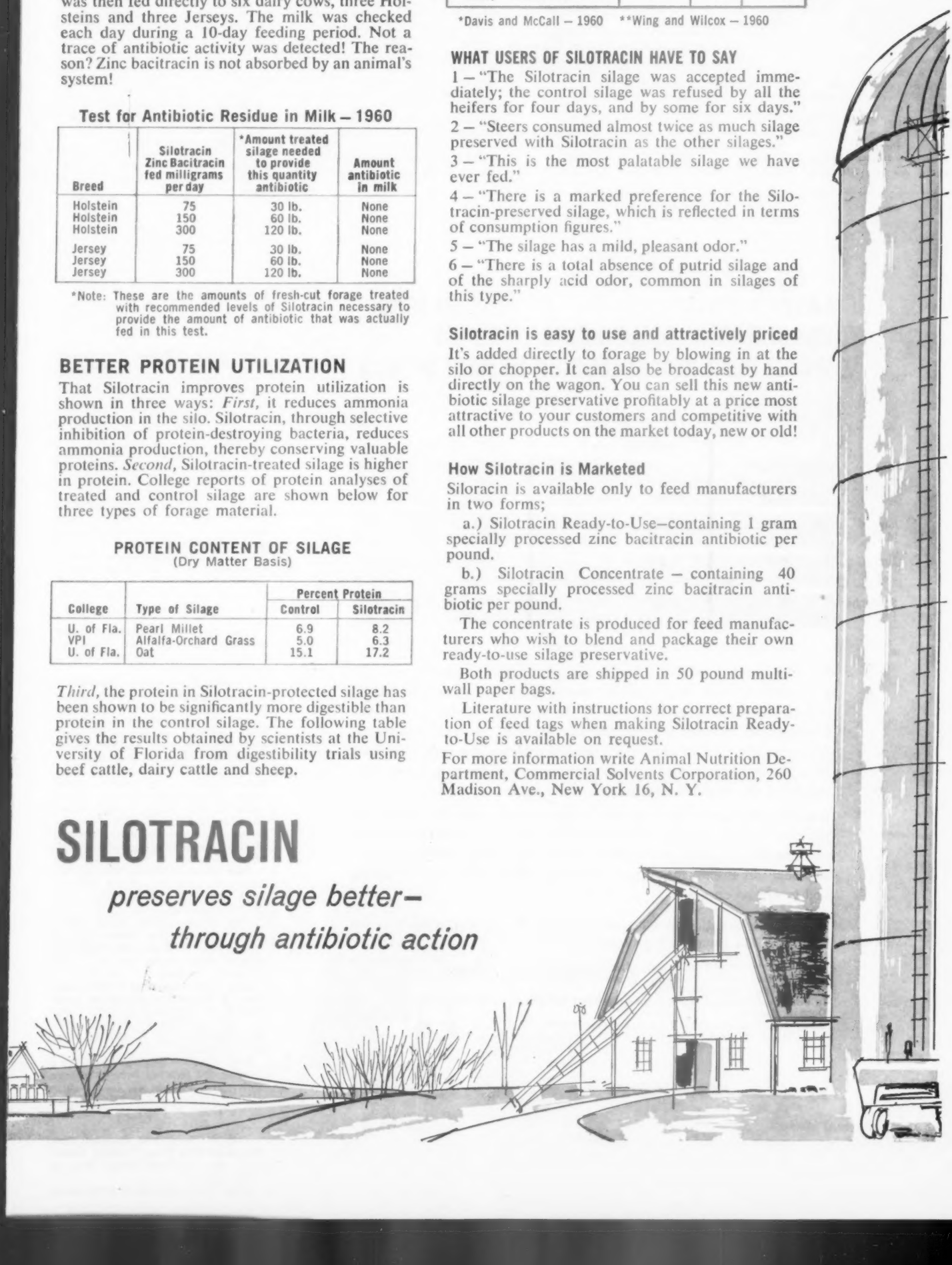
Literature with instructions tor correct preparation of feed tags when making Silotracin Ready-to-Use is available on request.

For more information write Animal Nutrition Department, Commercial Solvents Corporation, 260 Madison Ave., New York 16, N. Y.

SILOTRACIN

preserves silage better–

through antibiotic action



CALENDAR

(Continued from page 51)

nati, Ohio; L. E. Carpenter, Executive Director, Distillers Feed Research Council, 1232 Enquirer Bldg., Cincinnati 2.

March 8-9 — Nebraska Grain & Feed Dealers Assn.; Sheraton-Fontenelle Hotel, Omaha; sec., Howard W. Elm, Trust Bldg., Lincoln, Neb.

March 10-11—Oklahoma Feed Industry Conference and Workshop; Oklahoma State University, Stillwater; chm., Dr. Rollin Thayer, Poultry Science Dept.

March 12-13—Quad-State Grain & Feed Convention; Sheraton-Martin Hotel, Sioux City, Iowa; Sioux City Grain & Feed Club, Box 341.

March 15—Commercial Egg Production Short Course; University of Georgia, Athens; Dewey McNiece, Extension Poultry Dept.

March 16-17—Oregon Feed & Seed Dealers Assn.; Sheraton - Portland Hotel, Portland; mgr., Russ Hays, 702 Lewis Bldg., Portland 4.

March 16-17 — Maryland Nutrition Conference; Shoreham Hotel, Washington, D.C.; chm., Dr. R. D. Creek, Poultry Husbandry Dept., University of Maryland, College Park.

March 20-24—Grain & Feed Dealers National Assn.; Washington D.C.; sec., Herbert L. Sharp, 400 Folger Bldg., Washington 5, D.C.

March 23—Terminal Grain Weighmasters National Assn.; Statler Hilton Hotel, Washington, D.C.; Pres., A. E. Schultz, Toledo Board of Trade, Toledo 4, Ohio.

April 3-4 — National Institute of Animal Agriculture; Purdue University, Lafayette, Ind.; sec., Karl D. Butler, P.O. Box 521, First National Bank Bldg., Ithaca, N.Y.

April 5—Purdue Egg Day; Purdue University, Lafayette, Ind.; David D. Jackson, Ext. Poultryman.

April 6—Feeders Day; University of Nebraska Experiment Station, North Platte; James C. Adams, Supt.

April 7—Missouri Livestock Day; University of Missouri, Columbia.

April 9-13 — American Association of Cereal Chemists; Baker Hotel, Dallas, Texas; 1955 University Ave., St. Paul 4, Minn.

April 10-12—Poultry & Egg National Board; Sheraton Towers Hotel, Chicago, Ill.; mgr., Lloyd H. Geil, 8 S. Michigan Ave., Chicago 3.

April 13-15—Pacific Dairy & Poultry Assn. Exposition and Convention; Riviera Hotel, Las Vegas, Nev.; sec., Carl E. Nall, 1304 7th St., Los Angeles 21, Cal.

April 14-15—Texas Grain & Feed Association; Baker Hotel, Dallas, Texas; sec., R. B. Bowden, 407 Fort Worth Club Bldg., Fort Worth 2.

April 17-18—Seventh Regional Area Convention, National Renderers Assn.; St. Paul Hotel, St. Paul, Minn.; sec., Harold Weiss, Gulf Soap Corp., Arabi, Louisiana.

April 20 — Nebraska Beef Cattle Feeders Day; University of Nebraska, Lincoln; Dr. R. M. Koch, chairman, animal husbandry department.

April 20-22—California Hay, Grain & Feed Dealers Assn.; Jack Tar Hotel, San Francisco; sec., Leo L. Johnson, Blue Anchor Bldg., 1400 10th St., Sacramento 14.

April 22—Alabama Poultry Industry Promotion Dinner, Dinkler-Tutwiler Hotel, Birmingham, Ala.; sponsored by Alabama Poultry Industry Assn.; sec., W. L. Walsh, Box 567, Montgomery.

April 24-26—Animal Health Institute; Mayflower Hotel, Washington, D.C.; sec., D. L. Bruner, 512 Shops Bldg., Des Moines, Iowa.

April 27-29—Kansas Grain & Feed Dealers Assn.; Broadview Hotel, Wichita; sec., Orris E. Case, 609 Wiley Bldg., Hutchinson.

April 28—Indiana Cattle Feeders Day; Purdue University, Lafayette, Ind.; chm., Dr. W. M. Beeson, animal science department.

May 5—Broiler Short Course and Chicken-of-Tomorrow Day; University of Georgia, Athens; Dewey McNiece, Extension Poultry Dept.

May 7-10—American Feed Manufacturers Assn. Convention and National Feed Show; Conrad Hilton Hotel, Chicago, Ill.; sec., W. T. Diamond, 53 West Jackson Blvd., Chicago 4.

May 7-10—Association of American Feed Control Officials; Hamilton Hotel, Chicago; sec., Bruce Poundstone, Head, Feed and Fertilizer Control Dept., University of Kentucky, Lexington.

May 14-15—Missouri Grain & Feed Assn.; Hotel Coronado, St. Louis, Mo.; sec., D. A. Meinershagen, Higginsville, Mo.

June 8-11 — Canadian Feed Manufacturers Assn.; National Convention; Manoir Richelieu, Murray Bay, Quebec; national secretary, W. N. Hendrick, 2901 Bloor St. W., Toronto 18, Ont.; for registrations, T. G. Sevigny, Room 100, 355 McGill St., Montreal 1, Quebec.

June 9-10—Arkansas Poultry Festival; Little Rock; mgr., Arkansas Poultry Federation, John Haid, P.O. Box 1446, Little Rock.

June 12-13—Eastern Federation of Feed Merchants; Concord Hotel, Lake Kiamesha, N.Y.; sec., Austin W. Carpenter, Box 66, Sherburne, N.Y.

June 13-16—Northeastern Poultry Producers Council Egg Quality School; Pennsylvania State University, University Park, Pa.; sec., Richard I. Ammon, 10 Rutgers Place, Trenton 8, N.J.

June 15-17 — Delmarva Chicken Festival; Harrington, Del.; Delmarva Poultry Industry, Inc., R.F.D. No. 2, Box 47, Georgetown, Del.

June 19-21—American Association of Feed Microscopists Annual Meeting; Continental Denver Motor Lodge, Valley Highway and Speer Blvd., Denver, Colo.; sec., G. M. Barnhart, Missouri State Department of Agriculture, Jefferson City, Mo.

June 19-24—Feed Microscopy Short Course, sponsored by American Association of Feed Microscopists; Continental Denver Motor Lodge, Valley Highway and Speer Blvd., Denver, Colo.; sec., G. M. Barnhart, Missouri State Department of Agriculture, Jefferson City, Mo.

June 20-21—Alabama Poultry Industry Assn.; Whitley Hotel, Montgomery, Ala.; sec., W. L. Walsh, Box 567, Montgomery.

July 14-18—Georgia Feed Assn.; Grand Bahama Club, Grand Bahama Island; sec., W. E. Merritt, Suite 1-A, 361 E. Paces Ferry Rd. N.E., Atlanta 5.

July 18-20—American Poultry Congress & Exposition; Municipal Auditorium, Minneapolis; Don M. Turnbull, sec., American Poultry & Hatchery Federation, 521 E. 63rd St., Kansas city 10, Mo.

July 24-28 — Southeastern Egg Quality and Grading School; Auburn University, Auburn, Ala.; sec., Southeastern Poultry & Egg Assn., Harold E. Ford, 235 E. Ponce de Leon Ave., Decatur, Ga.

Aug. 24-26 — North Carolina Feed Manufacturers Assn.; Virginia Beach, N.C.; sec., McNair Evans, Box 44, Mocksville.

Aug. 24-27—Georgia Poultry Insti-

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No. in Medicated Group—5,091
No. in Control Group—6,818
½ ppm.

Dates 1959	Mean Temperature	Production Rate % Control Group	Production Rate % Medicated Group	Mortality Rate % Control Group	Mortality Rate % Medicated Group
July 14-31	102°F.	63.56	67.37	0.70 (48 birds)	0.37 (19 birds)
August 1-31	98.2°F.	65.44	69.16	0.90 (60 birds)	0.58 (29 birds)
September 1-30	94.2°F.	65.15	67.62	0.50 (33 birds)	0.44 (22 birds)

(After Parker*)

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*Parker, E. L.: Paper presented at The Second Conference on the Use of Reserpine in Poultry Production, The Institute of Agriculture, University of Minnesota, St. Paul, Minn., May 6, 1960.

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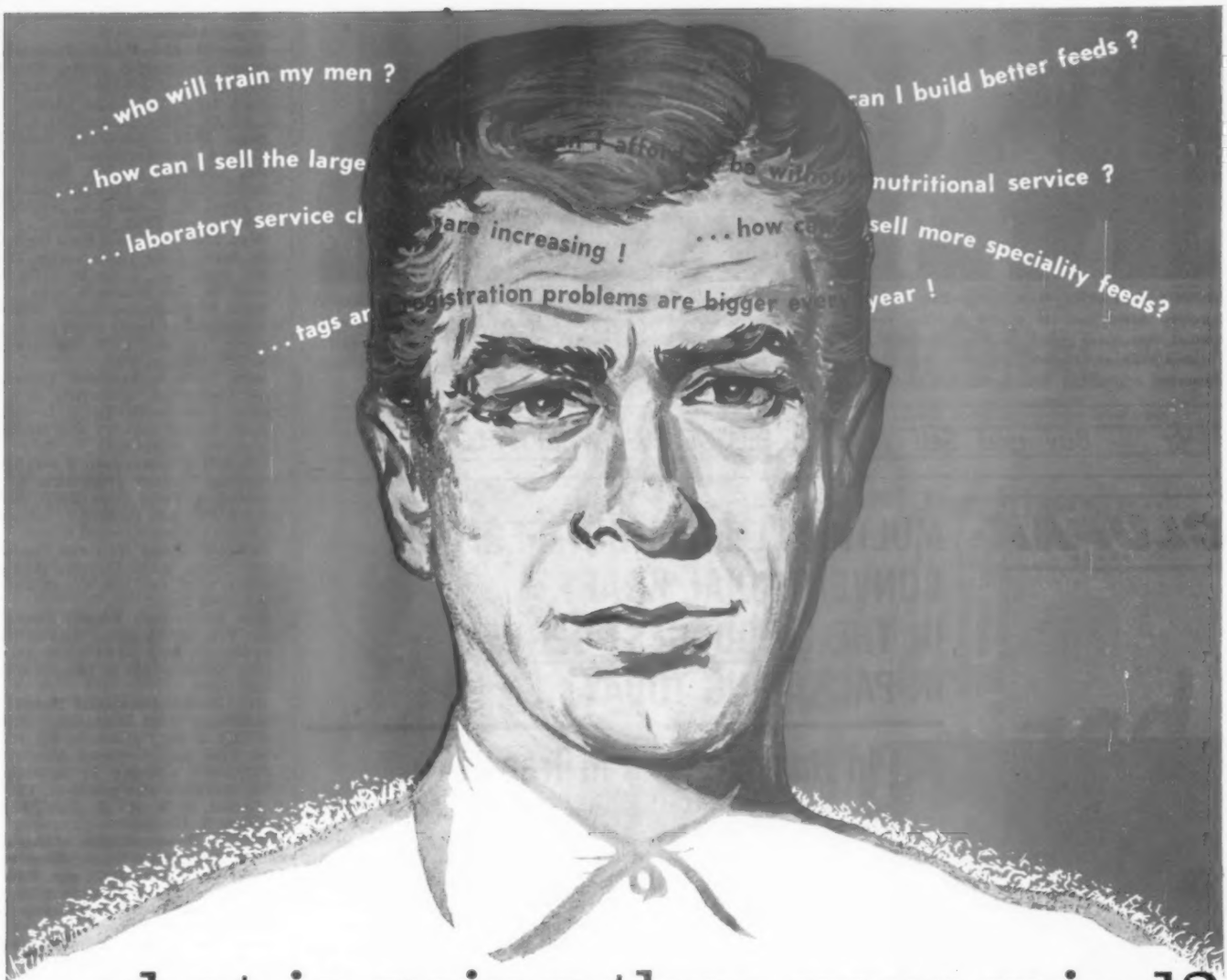
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FLORIDA POULTRY MEETING—The Florida Poultry Producers Assn. held its winter meeting recently, and informal discussion groups are pictured here. Photo at left shows Frank Powell, salesman for Florida State Hatcheries, explaining some printed material to Parker Anthony, poultryman from Lakeland, while Carroll Douglas and Joe Ford look on. At right, several Florida poultrymen are pictured in another discussion. From left, they are Bill Wainright, Ray Starnes, Steve Voscinar and Emmet McGriff.

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tute; Rock Eagle 4-H Club Center, Eatonton, Ga.; Dewey McNiece, Extension Poultry Dept., University of Georgia, Athens.

Sept. 11-13—Feed Production School; Continental Hotel, Kansas City; sponsored by Feed Production School, Inc., pres., Lloyd Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Sept. 19-21—Marketing Seminar for Feed Manufacturers; Morrison Hotel, Chicago; **Sales Executives** Council, American Feed Manufacturers Assn., W. E. Glennon, president, 53 W. Jackson Blvd., Chicago.

Sept. 27-29—National Feed Ingredients Assn.; Lake Lawn Lodge, Delavan, Wis.; sec., I. Levin, 517½ E. Locust St., Des Moines 9, Iowa.

Sept. 27-29—Pennsylvania Millers & Feed Dealers Assn.; Hotel Hershey, Hershey, Pa.; sec., D. W. Parke, P.O. Box 329, Ephrata, Pa.

Sept. 28-29 — Arkansas Formula Feed Conference; University of Arkansas, Fayetteville; Dr. E. L. Stephenson, animal industry and veterinary science department.

Oct. 3-5—Northeastern Poultry Producers Council Exposition and Convention; Farm Show Bldg., Harrisburg, Pa.; sec., Richard I. Ammon, 10 Rutgers Place, Trenton 8, N.J.

Oct. 4-6—Texas Nutrition Conference; Texas A&M College, College Station; chm., Dr. J. R. Couch, Poultry Science Dept.

Oct. 10-11—Iowa Poultry Convention; Veteran Memorial Auditorium, Des Moines; sec., Iowa Poultry Assn., LeRoy Kruskop, 535 E. Lincoln Way, Ames, Iowa.

Oct. 23-25 — Centennial Nutrition Conference; Hotel Muehlebach, Kansas City 5, Mo.; sponsored by Midwest Feed Manufacturers Assn. and Land-Grant Colleges in Midwest's area; executive vice president, Lloyd S. Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Oct. 26-28—Association of American Feed Control Officials; Shoreham Hotel, Washington, D.C.; sec., Bruce Poundstone, Head, Feed and Fertilizer Control Dept., University of Kentucky, Lexington.

Nov. 1—Animal Nutrition Research Council; Shoreham Hotel, Washington, D.C.; sec., Dr. Philip Derse, Wisconsin Alumni Research Foundation, 506 Walnut St., Madison 5, Wis.

Nov. 1-2—Kansas Poultry Assn.; Broadview Hotel, Wichita; sec., Harry J. Reed, Box 663, Manhattan.

Nov. 8-9—Illinois Feed Assn.-Illinois Poultry and Hatchery Federation joint convention; Springfield Armory, Springfield; sec. I.F.A., Dean M. Clark, 141 W. Jackson Blvd., Chicago 4; sec. I.P.H.F., Aubrey Harless, Shelbyville, Ill.

1962

Aug. 13-18—12th World's Poultry Congress; Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia; **Dr. Cliff D. Carpenter, chairman, U.S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Cal.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.**

IOWA FIRM

(Continued from page 65)

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Officers of this growing Iowa concern are William De Haven, president; Andrew Kroger, vice president and Thomas Murphy, secretary and treasurer.

COPPER

(Continued from page 45)

levels of supplementary copper fed to young pigs may improve gains and feed conversion. English workers have reported consistently favorable results from the feeding of 250 ppm. copper in the form of copper sulfate. An initial favorable response to copper feeding was almost always observed in the Florida studies but tended to disappear as the experiments progressed. The copper effect is probably bacteriostatic in nature but definite evidence on this point is lacking.

The most critical aspect of the problem of feeding swine high levels of copper is toxicity. The margin of safety between effective levels and toxic levels appears to be small indeed. Since copper is an accumulative poison the danger becomes even more acute. Short time feeding trials are apt to be very misleading. It has been our observation that an early response to high level copper feeding is often followed by depressed performance during the terminal finishing period. Copper toxicosis observed in Florida experiments included (1) reduced feed intake and poor growth, (2) fading of haircoat in Duroc pigs, (3) anemia, (4) impairment of bone development, (5) copper accumulation, particularly in liver, and (6) general icterus or jaundice throughout body. Pigs showed much individual variation in susceptibility to copper poisoning. It has been said that pigs will cease to eat in preference to poisoning themselves with copper. Results at the Florida station indicate that this is not a factual statement.

Another very important consideration concerns the possible harmful effects of high levels of copper on other constituents in mixed feed. It is quite conceivable that high levels of copper may catalyze certain oxidative reactions to the detriment of the overall nutritive value of the feed. Such possibilities must not be disregarded.

Forms of copper other than copper sulfate may prove more useful in swine rations. Bunch et al. (13) have reported that copper oxide induced less liver copper accumulation than copper sulfate but was equally effective in stimulating gains.

It appears that 5-10 ppm. copper is adequate to meet the nutritional requirements of the pig. Additional copper, up to a maximum of 100 ppm., may result in a beneficial bacteriostatic effect under certain conditions and likely would be non-toxic. Higher levels should not be fed to swine. The danger of toxicity is very real and extremely unpredictable.

v v

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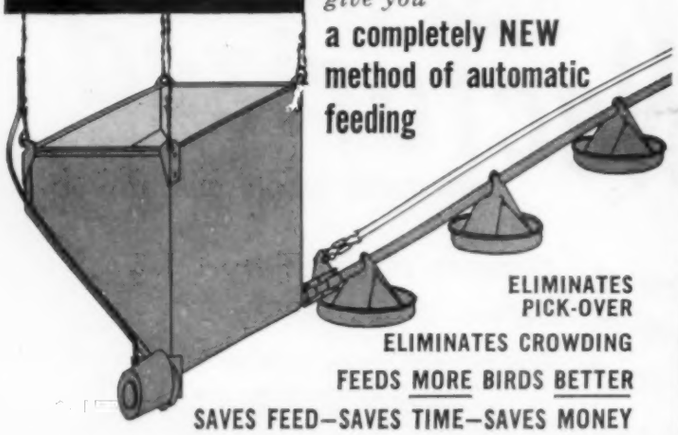

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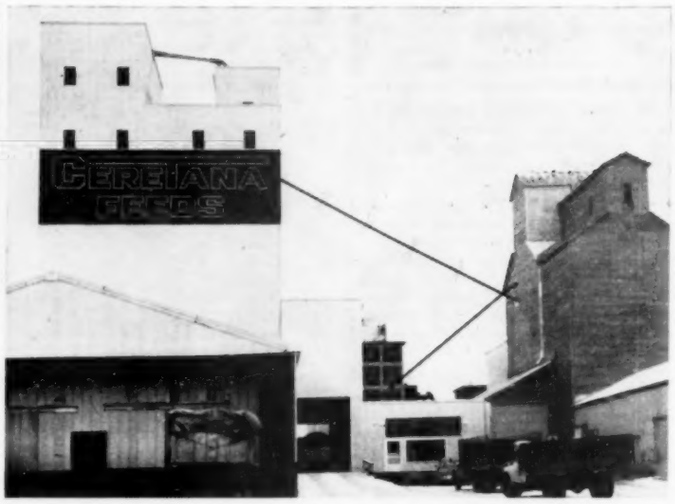


NEW FEED PLANT—Montana Flour Mills recently completed construction of this feed plant at Great Falls. The existing country elevator at right was used to house steam-rolling facilities. The retail farm store can be seen as the low building in center of photo and the company's flour mill is in the background.

Montana Flour Mills Opens New Plant at Great Falls

Montana Flour Mills Co. recently held five days of open house at its newest feed plant, which went into production at Great Falls, Mont., in mid-November.

Separate "open house" days were set aside for company employees at the Great Falls general office, agents of the 50 county elevators owned by the company, independent Ceretana dealers, and two days for the public.

Montana Flour Mills has manufactured feed since the 1920's. Its Ceretana feeds are currently produced in company paints at Bozeman and Missoula, in addition to Great Falls. And the Milk River Elevator Co. at Chinook produces Ceretana under an agreement. All feed plant locations are in Montana, but the dealer organization and service area include eastern Idaho and northern Wyoming.

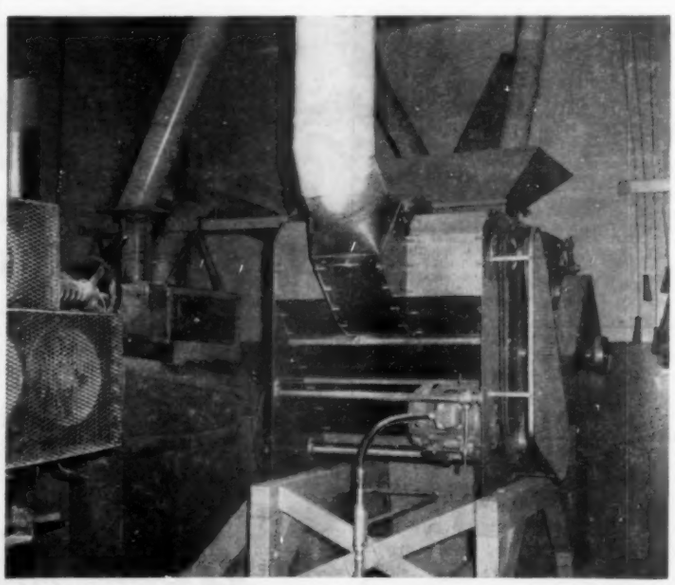
Harry C. Johnson, vice president and manager of the feed division, hosted guests by showing them the wide range of services concentrated under one roof at the new plant. Being able to serve the customer, whatever his needs, is the first rule for increasing Ceretana business.

In addition to the production of some 50 Ceretana brand feeds, customer services include grinding, mixing, pelleting, addition of various concentrates and additives, steam-rolling with hot molasses and supplements, and delivery of all feeds and wheat mill run in bulk or sacks. Farmers can sell their grain at the mill, have it manufactured into custom feed, or trade it for pellets. A complete line of allied products—fertilizers, chemicals, equipment, and the like—is merchandised through the adjoining farm store.

It's obvious that Mr. Johnson, a director of the American Feed Manufacturers Assn., believes in offering a wide range of custom services. But before closing a sale where a custom service is involved, Ceretana employees attempted to switch the customer to a regular formulated feed. Custom feeds too often provide only part of the nutrition that is needed, the company believes, with the customer's main interest being a low price. Custom service seems to be increasing in importance in the over-all Montana Flour Mills feed operation and the help of Dr. W. H. Burkitt, director of nutrition, is available to those seeking this assistance.

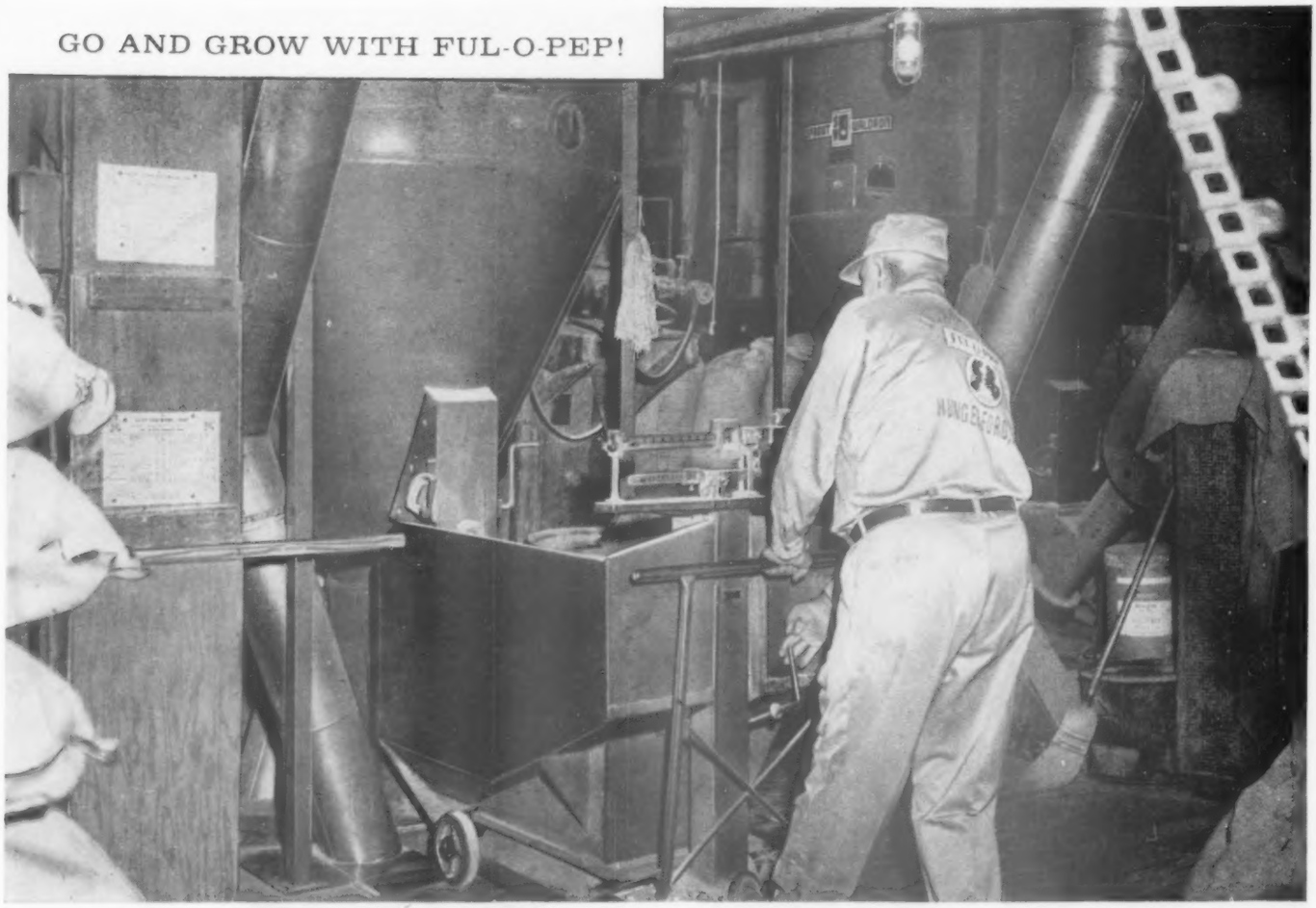
The new feed mill was built at Great Falls to take advantage of

(Turn to page 76)



STEAM-ROLLING EQUIPMENT—Here are the three major pieces of equipment that occupy the steam-rolling room at Montana Flour Mills' Great Falls plant. From left, they are the scalper, stoner and steam-roller; each performs its job in that order.

GO AND GROW WITH FUL-O-PEP!



This new mixer is one of two installed about 1 year ago to replace older equipment. The Andersons feel this is a transitional period for the feed business... and grind-mixing and bulk service is essential to keep them out in front. "We've been with Ful-O-Pep for 17 years," said Mr. J. K. Anderson. "We know, and our customers know, we can depend on Ful-O-Pep Concentrates for result-getting feed."

"Our sales jumped 25%

...with Ful-O-Pep backing in bulk and grind-mixing!"

— says Richard Anderson, Anderson Feed Co., Hungerford, Pa.

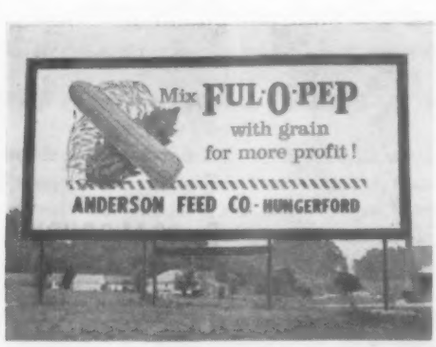
"Our farmers today need bulk handling and local grind-mixing to keep costs in line," says Richard Anderson of the Anderson Feed Co., Hungerford, Pa. "We needed bulk and grind-mixing to grow... and Ful-O-Pep's aggressive leadership in this field is proving a real key to sound growth for us."

The Andersons installed bulk equipment a little over a year ago. They also modernized their mixing equipment. Today, their total tonnage is up about 25% ... customers like the money they save... and keep coming back for more!

GO AND GROW WITH FUL-O-PEP! *For information on Ful-O-Pep's 5-Point Bulk and Grind-Mix Program, write: Feed Sales Division, The Quaker Oats Company, Merchandise Mart, Chicago 54, Illinois.*

Anderson's modern plant includes six 15-ton bins for holding Ful-O-Pep Concentrates and Ful-O-Pep feeds. They are adding additional storage for grain and bulk feed. Ful-O-Pep engineers helped develop plans.

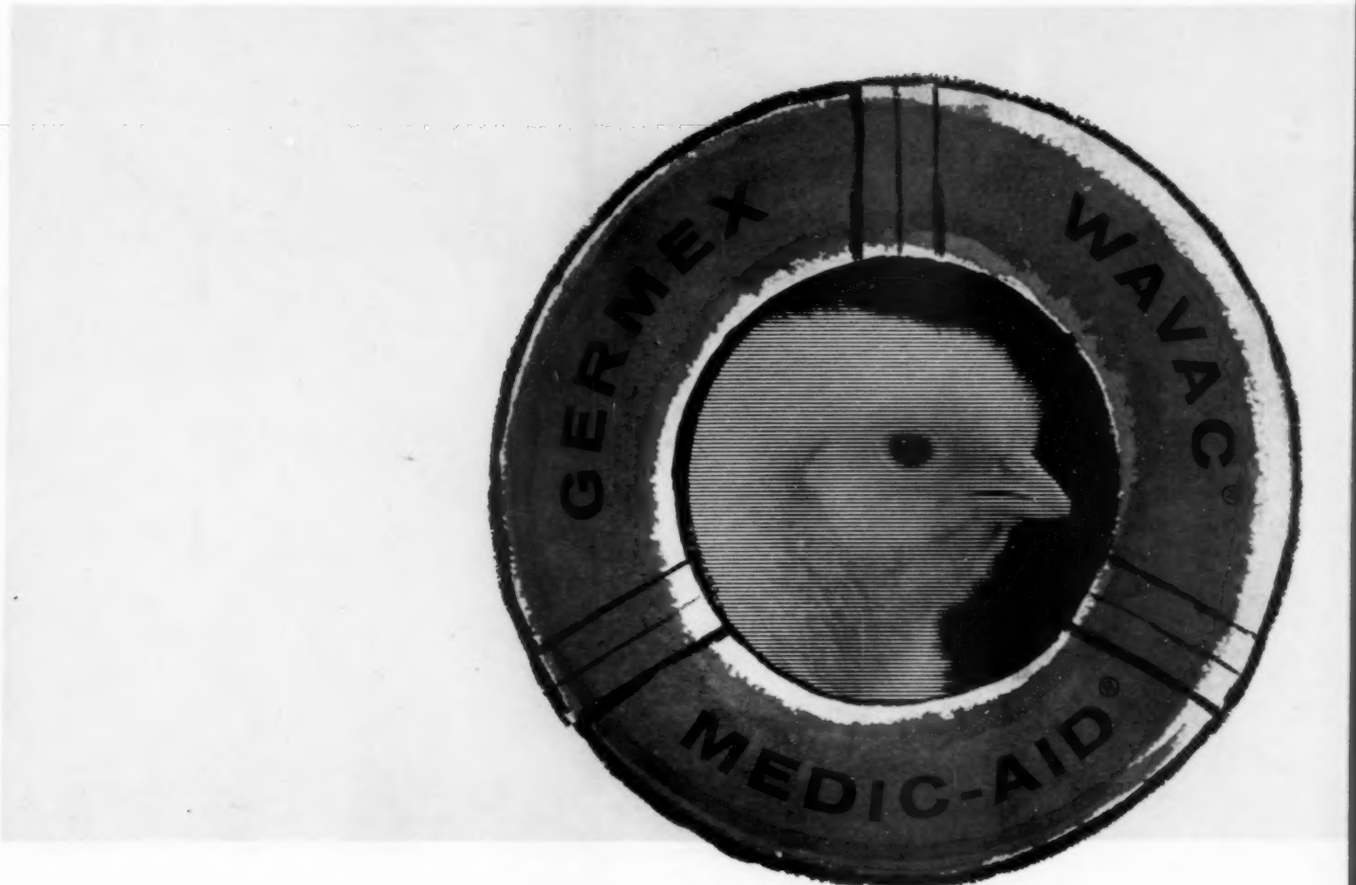
"Bulk business is growing fast," says Richard Anderson, manager. "We believe 75% of our tonnage soon will be bulk." When the Andersons deliver feed, they often pick up a load of grain to store in their "rotating" grain bank.



Advertising and merchandising is important, the Andersons believe. They take full advantage of Ful-O-Pep's extensive program for dealers. They also maintain roadside shelters, with Ful-O-Pep advertising on them, for use by school children.

FUL-O-PEP

MADE BY THE QUAKER OATS COMPANY



cash in on growing demand for Dr. Salsbury's

Life Saver program helps avert any blame on the feed

Mr. Feed Manufacturer: It's usually the feed that gets the blame when chicks develop poorly. That's why you, the feed manufacturer, are interested in the grower raising a healthy flock. Dr. Salsbury's Life Saver program keeps the flock in a condition that permits your feeds to do the kind of starting and growing job they were formulated to do. It's a program that, with recommended management practices, helps keep disease out of the flock. Even the appetites of those healthy chicks stay razor-sharp. Chicks eat more and do even better on your feeds.

Dr. SALSBURY'S LABORATORIES
Charles City Iowa, U.S.A.

MORE THAN PRODUCTS—A SYMBOL OF SERVICE

Life Saver program for chicks is big money maker for you!

proven chick health products

The Dr. Salsbury Life Saver program for chicks joins the raiser in his war on germs, chick disease, and death during the most critical period in a bird's life. Here's a chick health program that means healthier pullets and more of them—a health-boosting, health-maintenance plan that prepares birds for the demands of future egg production. This is what the poultryman wants from you . . . a hatch-to-pullet Life Saver program. Now, Dr. Salsbury can arm you with it.

Contact your Dr. Salsbury's representative for further information about the Life Saver program. And stock up NOW on Dr. Salsbury's famous chick health products!

GERMEX *disinfectant, sanitizer*

Sell this powerful germ killer for customers to use prior to putting chicks in brooder house. One quart makes 256 gallons of general disinfectant at a cost of less than 1¢ per gallon. Odorless, tasteless, non-poisonous when used as directed. Ideal for use anywhere on the farm or in the home.

WAVAC® *drinking-water vaccine*

This vaccine protects against Newcastle and infectious bronchitis. It's easy to use, easy to sell. Should go right with the chicks. And remember—Dr. Salsbury's has a complete vaccination program that makes it practical for you to sell on a program basis. This means more satisfied customers, repeat sales, better profits!

MEDIC-AID® *drinking-water stress fighter*

Medic-Aid is a real volume builder for you and a chick health builder for your customers. Mixes instantly with drinking water. Contains 9 vitamins, 2 antibiotics. Protects health, stimulates appetites. Half pound treats 750 chicks for 4 weeks at less than 1¢ per chick. No wonder there's a growing demand for Medic-Aid!

Mr. Dealer: *The complete Life Saver promotion helps you sell more flock health products*

NATIONAL ADVERTISING *helps pre-sell your customers*

Dr. Salsbury's Life Saver program for chicks is being advertised to flock owners all across the country. Your customers will see—and hear—its sales message on radio and in farm and poultry papers such as: Successful Farming, Poultry Tribune, Everybody's Poultry Magazine, The Poultryman, Rural New Yorker, Florida Poultryman, Texas Poultry Industry, and others.

LOCAL SALES AIDS *help get customers into your store*

Your Life Saver sales kit contains everything you need to make 1961 your biggest year on the sale of flock health products. It's loaded with such sales aids as colorful product folders, a 4-page sales bulletin, product photos, attractive point-of-sale display piece, plus sales letters on the Life Saver program. Also, Dr. Salsbury's 1961 Poultry Health Messenger will follow the Life Saver theme, thus adding sales punch to your chick health promotion.

FEEDLOT GATHERING—The National Alfalfa Dehydrating & Milling Co. entertained a group of commercial feedlot operators in the Plainview, Texas district recently. Held in the Hilton Hotel, the meeting featured a showing of the new alfalfa dehydrating film, "Twelve Month Summer," dinner, and a discussion of the feeding of pelleted roughage and pelleted feeds to beef cattle which was conducted by John J. Clay, National Alfalfa.

Pictured at the dinner are, left to right: John J. Clay, National Alfalfa, Kansas City; Jim Davidson, Sudan Livestock & Feeding, Sudan, Texas; Grady Shepard, Grady Shepard Co., Hale Center, Texas; Earl McCready, National Alfalfa, Lockney, Texas; Dean Bishop, National Alfalfa, Muleshoe, Texas; Elmo Cowart, National Alfalfa, Plainview, Texas; R. M. Carter, Carter-Kirchhoff Feed Yard, Plainview; Ray Copeland, National Alfalfa, Plainview; A. R. McFadden, National Alfalfa, Kansas City; Murray Edwards, Clovis Feed Yard, Clovis, N.M.; Dewey Tucker, Clovis Feed Lot, Clovis; Fowler McDaniel, Fowler McDaniel Co., Tulia, Texas; J. C. Rhoderick, Hill-Rhoderick, Plainview; Harold Chewning, Southwestern Public Service, Plainview; Fred Davidson, Carter-Kirchhoff, Plainview; Virgil Ritchie, National Alfalfa, Hereford, Texas; Joe King, Plainsman Feed Yard, Plainview; Austin Blackburn, Clovis Feed Yard, Clovis, and J. D. Wood, National Alfalfa, Plainview.

northern and central Montana's barley surplus. Twenty-six million bu. of barley were grown within a 100-mile radius of Great Falls in 1959. The conversion of barley into beef is becoming popular in Montana, as has been reported by other authors.

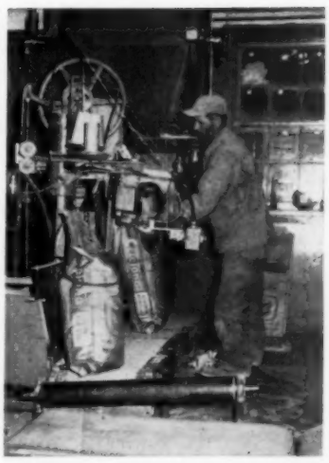
Both the Farmers Union Grain Terminal Assn. and the firm of Graham & Ross operate feed plants, with steam-rolling and pelleting facilities, in Great Falls.

Hogenson Construction broke ground for the new Montana Flour Mills plant in April of 1960, with production starting in November. Cost of the project exceeded $500,000.

Built on company property in Great Falls, the feed plant is attached to what was an existing country elevator. Steam-rolling facilities were built into that older structure.

Millrun Moved by Air

A company flour mill on the same property pumps wheat mill run to the feed plant through a 3-in. pipe, 550 ft. long. The flour by-products are air-fluidized at the flour mill, and pumped through the underground pipe, using only 5½ lb. of pressure. The economy of this feature is emphasized when compared with the former practice of shipping the ingredient 200 miles to Bozeman for manufacturing, and then bringing finished feed back to the Great Falls area for sale.



OPERATION SACKING — A Richardson packer with rated capacity of 15 sacks per minute is pictured here in the new feed plant of Montana Flour Mills at Great Falls. Belt conveyors carry sacks to the warehouse where they are palletized and delivered to trucks or stored.

Equipment includes a Hardy electronic batching system with a 4,000-lb. hopper scale, a Strong-Scott horizontal mixer located below the Hardy, and a California pellet mill with 10 tons per hour capacity. Sacked feed is packed on a Richardson machine with rated capacity of 15 sacks per minute. Only 50-lb. paper bags are packed, a measure designed to improve packing and warehousing. As sacked feeds come off the line, they are palletized into units of 42 sacks and warehouseed or delivered to the truck dock by fork lift. This is the first experience Montana Flour Mills has had with palletizing; it is pleased with the method.

Ingredients are brought in over a 60-ft., 50-ton truck scale and bulk finished feeds are loaded out over the same scale. Forty-two bins over the feed mill can hold 2,000 tons of ingredients, including 300 tons of bulk finished feeds.

Other equipment in use includes a Clayton-Brooks steam-boiler with 150-horse capacity and 140-horse hammermill.

Stoner Used

Steam-rolling facilities include scalper and stoner along with the Wagner corrugated roller which has 10-tons per hour capacity. Hot cane molasses and supplements are applied to the grain after rolling in a cut-flight conveyor.

Montana Flour Mills was one of the first to make use of a stoner in steam-rolling installations. Removal of the marble-sized rocks which are prevalent in much of the barley protects the rolling equipment from damage, and rocks would force the rollers apart, allowing some grain to go through unrolled.

Montana Flour Mills Co. has not been shy in recommending steam-rolled barley with fortified supplement, and no additional roughage, for feedlot cattle. One program on the feed division's "Ceretana Time" television series features testimonials from feeders who are using this program successfully. Fieldmen are armed with concrete facts and figures on what results a feeder can expect from this newest feeding development. Steam-rolling is definitely on the increase in Montana.

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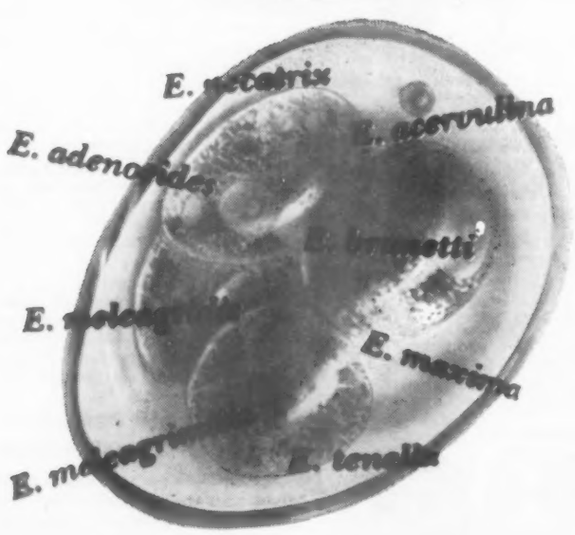

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S.Q.—used promptly at therapeutic levels—will check coxy outbreaks . . . cut losses by holding mortality and stunting to a minimum . . . keep flocks on feed until the outbreak is under control.
Merck Chemical Division, Merck & Co., Inc., Rahway, N. J.

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FEED CONTROL COMMENT

By BRUCE POUNDSTONE
Secretary, Association of American Feed Control Officials
Kentucky Agricultural Experiment Station, Lexington

Feed Terminology

An announcement (Feedstuffs, Jan. 28, 1961, page 8) says the American Feed Manufacturers Assn. is endeavoring to clarify terms with respect to Food and Drug Administration opinions. The matter of terminology is a problem that has plagued feed people over the years, especially feed officials. Nutritionists, manufacturers and control people alike see the need for such clarification. This is one of the reasons for a very important committee of the AFMA. One of the objectives of the Association of American Feed Control Officials is to promote "uniformity of definitions."

Some terms, however, have escaped exact definition by these groups. Complete feed, concentrate and ration are among these. These and other terms are very important. Until now they have not been considered of sufficient importance to have merited the trouble to reach agreed-upon nomenclature. We have done little more than talk about them. With today's legal framework the emphasis on interpretation becomes more meaningful. Definitions will become even more necessary.

"A Good Start"

The proposal thus far is a good start. It probably will need to go much farther. The first definition proposed defines the expression "complete feed." The third word in the definition is "ration." What is meant by "ration"? This, likewise, must be defined. Further on is the word "feedstuffs." What is or are "feedstuffs"?

A review of the literature will reveal interpretations of these terms in great variety. One need not go far to find the same terms used differently in the same official document. This is especially true of reports from our colleges. Each manufacturer feels he is entitled to have a special term for his own particular one. If someone calls his product a concentrate, the next calls his a balancer or supplement. To dairy people, in some areas of the country, the term "concentrate" is used frequently to refer to what AFMA proposes to define as a "complete feed."

To some a ration is everything the animal eats, including roughage and water. In interpreting ration, especially in the southern states, we have said that ration included all that was fed exclusive of water.

"Happy to Cooperate"

AFMA knows that the Association of American Feed Control Officials is solidly behind them when it comes to working on nomenclature. We will be only too happy to cooperate.

Experience with nutritionists and college people would lead one to suggest it will probably be a long time before all use terms agreed to in whatever manner they are defined. To finally do so will require rewriting most, if not all, of the text books. Extension literature and research publications are in the same boat. It should surprise no one to learn that many terms in feed parlance are now used in many different ways.

Tomorrow's Feed Tag

E. A. Epps, Jr., president of the Association of American Feed Control Officials, has asked John Kuzmeski of Massachusetts to serve as a special investigator to review present feed labeling requirements. Such an examination and reevaluation will be welcome.

Does the information printed on feed tags today properly reflect modern nutritional know-how? This is often asked and is a subject of interest to feed men and feed officials. It has been discussed often in the past decade.

Warren A. Armstrong of Nutrena Mills brought this subject into the limelight in his paper, "Feed Formulation by Linear Programming and Its Effect on Feed Control Work." This was presented at the 1960 annual meeting of the Association of American Feed Control Officials and is published beginning on page 80 of the 1961 annual publication.

Mr. Kuzmeski hopes to have a preliminary report at the spring meeting of the AAFCO in Chicago. He solicits comments and suggestions from industry, college and control officials.

Poultry Plant Option

UNION SPRINGS, GA. — Armour & Co. has taken a 30-day option on a county-owned poultry processing plant here, according to State Senator Lawrence K. Andrews, who is chairman of the Bullock County Development Authority.

Senator Andrews said "prospects are bright" that the $326,000 facility, idle for the past six months, will be in operation again by April 1.

Built with revenue from a county-wide 1¢ sales tax, the plant was operated by Poultry Products, Inc., from May, 1959, to July, 1960. The corporation went into receivership at that time.

R. W. Czirr, manager of Armour's poultry processing plant at Prattville, said the local plant would require an estimated 150,000 broilers per week. It is anticipated Bullock County producers can supply that many broilers.

Hatchery Construction

HOPE, ARK.—A new 11,400 sq. ft. hatchery is being constructed here by Corn Belt Hatcheries of Arkansas.

Officials said the facility will have 10 incubators with a capacity of 99,000 eggs each. The unit will replace a hatchery sold recently to Mountaire Poultry Co.

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Percent of Vitamin A remaining after 3 months	98.6	97.8	95.4	98.6	95.6	95.4

COMPLETE AVAILABILITY: Biological tests prove Dawe's FIXTAY is fully available to the animal for early absorption in the digestive tract.

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A Five-Year Look Ahead

At Feed Manufacturing and Distribution

From the Manufacturing Point of View

By S. J. Beyhan
Cooperative Mills, Inc., Baltimore, Md.

Optimism has been a necessary qualification for doing a job in feed grain merchandising and in feed manufacturing for 25 years. At this particular time, however, we're more than ordinarily grateful from the feed manufacturing viewpoint for this support in Oakley Ray's expectation that formula feed tonnage will increase. Certainly continued population increase and its increased per capita consumption of animal argriculture's food support optimism about increased use of production supplies required in growth processing of this food. And, as we see still more industrialized specialization of feeders with consequently increased attention to labor cost on their part of this job, we're satisfied that formula feed adapted as it is to industrialized, production-line use will continue to account for an increasing share of total feed used.

Unlike buggy whips then, formula feed and more of it will be put to use in future years. The pertinent question is: "By whom?" Or, by what kind of family or corporate entity or division of such organization? And, with what kind of responsibility for this growth-processing part of this food production job?

Will this responsibility be that of complete, risk-taking independence? Will this responsibility be cooperatively interlocked with responsibilities for other parts of the total job? Or, will the responsibility for this growth-processing part of this work be subordinated to management of those who manage other parts of the total food production job, including its financing?

We think we can answer the question Mr. Ray asks—"Who will supply the feed?"—as soon as we find out who is going to use it. While we watch the momentum of trends for a more definite answer, we know enough now to know that we need to look ahead to recheck our target and our method of reaching it.

Comments on Specialization

If this is the era of agriculture specialization, we won't need to worry very long or very much about a do-it-yourself trend on feed supplies. With specialization's efficiency, not even the largest feeder will be able to formulate on freshly applied research or purchase with current market knowledge, or afford as much controlled manufacturing of feed for uniform quality and productive efficiency. He won't be able to do this job at the cost levels we find possible in volume-efficient, 60,000-annual-ton mills. Particularly when such mills are operated as decentralized units by a centralized staff of management specialists.

The larger feeders can, however, get plenty of interested help in making what may look like an economically advantageous pass at this work against the price put on products of these volume-efficient mills. This is particularly so when these prices carry not only the expenses of distribution including any time-availability, feeding management service, and credit, but also a traditionally heavy loading for the expense of promotional and institutional program.

Concentrates

Increased use of concentrates as mentioned by Mr. Ray is not, however, a universal trend—or one that is of real economic usefulness in all areas. This two stage manufacturing —protein-vitamin concentrates or vitamin-drug premixes in one stage and the complete feed in the second—has valid economic justification in a good many situations. Particularly, where feeding operations are spread out and isolated by long distances in open areas of big country these situations will continue to exist for some time.

Where transportation is expensive and where the best market for locally available feed grain is through livestock, it makes sense to bring easily handled concentrates to the feed grain and to the livestock. In concentrated feed use areas, however, this two-stage manufacturing has cost disadvantages. It requires double handling. There's the concentrate manufacturer's need for over-protection against the possibility of inadequate levels in the final ration. And, there is the expense of needless freight on the diluting carrier-material.

In addition to lack of precision and of pelleting or crumbling at the level of secondary manufacturing, there is probably the lack of ability to get 24-hour, five-day, maximum open time out of depreciating machinery and equipment investments. Two-stage manufacturing, including secondary manufacturing at so-called satellite mills, is not something for the long pull. It doesn't conform with the criteria of industrialized efficiency which Mr. Ray has mentioned as being least cost labor, transportation and handling.

No matter where feed manufacturing is located, and no matter how it's operated, we see only very thin possibilities for miniaturizing this kind of high volume, low margin, materials handling work. Not with any real expectation for equal efficiency of the small unit with large volume units. We hope one day that we may get fairly close to being able to build 40,000 tons of annual capacity at two thirds of the cost of 60,000 and closely approach the larger plant's efficiency. We doubt that we'll reach this objective until we get pretty deeply into another five years.

Change of Thinking

It will take a little more economic changing of traditional thought patterns to permit agricultural business operators to look upon a $750,000 mill as "local" or of "moderate" size. We believe this change of thinking can come, however, as we see more such mills manufacturing competitively productive feed in pelleted form at total cost for all manufacturing and its administration of from $3 to $3.50 ton. We believe that such mills will eventually pick up most of the marbles in the competitive service of specialized feed supply.

In further reference to Mr. Ray's mention of the search for the best method to supply the feed needed to produce food, we don't expect the law of survival to be repealed. We do know now, therefore, that cooperative feed purchasing as a total supply service will accommodate to demands of the most efficient, most surviving method by which feed is converted to marketable meat, milk and eggs. We will accommodate to such feed use eventually by design, by drift or by getting out of the way. It may take more than five years to see evolution of some parts of the most efficient front to back system for handling animal agriculture's processing.

"Some Narrowing Down"

Within five years, however, we should see some narrowing down of the intermediately surviving methods. One of these arrangements for at least intermediate survival looks to be use-located, volume-efficient mills serving volume feeding, processing and marketing operators or organizations at minimum, return-on-investment margins.

Mills serving southern California feed buying groups now serve as an unenthusiastic example of this survival method. These mills, despite griping, have some advantages. They are operating at full throttle and, at their prices, very few Southern California feeders have interest in farm feed mixing. If we should see that it's advisable in farmers' interest to discontinue encouragement of the duplication and triplication of cooperative feed manufacturing facilities, we want to keep this approach in mind.

Another method which will be at least intermediate during survival evolution of the most efficient method will certainly be one with which we've had some experience. This is an arrangement of use-located, volume-efficient mills serving volume hatching, feeding, processing and marketing operations as a cost-conscious division of this integrated production.

The mills which we operate for Cotton Producers Assn. serve as a close example. Speaking for Cotton Producers Assn., as well as for Cooperative Mills, both owning and

---

EDITOR'S NOTE: The Feb. 4 issue of Feedstuffs reviewed in a page 1 story a feed industry trend-and-outlook type talk presented by Oakley Ray, director of market research, American Feed Manufacturers Assn., at the early-January annual meeting of the National Council of Farmer Cooperatives. This news report referred to the complete text of Mr. Ray's talk, "A Five-Year Look Ahead at Feed Manufacturing and Distribution," reprinted in the same issue, and summarized discussions of his comments from the manufacturing point of view (by S. J. Beyhan, executive vice president, Cooperative Mills, Inc., Baltimore, Md.) and from the distribution point of view (by Kenneth Lundberg, director of operations, Western Farmers Assn., Seattle, Wash.).

Feedstuffs presents on this page Mr. Beyhan's complete discussion of Mr. Ray's talk.

Mr. Ray said the feed-supplying method likely to be most prevalent in 1965 will maximize efficiency through the entire process of obtaining ingredients, producing the feed and distributing it to the point where it is consumed by livestock.

Mr. Beyhan concluded: "During the five years ahead, cooperative feed purchasing, as a service industry or as a service division, will attain its objective by supplying more efficient feeds as a processing supply to a more totally efficient animal agriculture."

Q. What carrier protects vitamin A without sacrificing digestibility?

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operating organizations are well satisfied with the effective and efficient working of this arrangement.

"Can't Duck Dynamite"

We just can't duck integration's dynamite for an independent feed industry's traditional operations. In the heavy competitive presence of this beginning integration of poultry meat production, we can see probable need for changing the somewhat independent position of this feed supply service work. It's conceivable and now more than just possible that the only organizations which will have opportunity for efficient manufacturing of feed in future years are those which can also efficiently market poultry and livestock food products.

In our rechecking for the best course to survival and reattainment of cooperative feed purchasing's objective, we are convinced that regardless of some surplus capacity, we are going to need still more volume-efficient manufacturing units. These units will need to be engineered to accommodate the needs of large feeding operations which specialize in one type of conversion and concentrate their location for short hauls to dressing and packing plants. We don't believe that many of these units will be satellite mills for long.

As feed distribution changes the form of its service—from convenience retailing to growth processor wholesaling—feed manufacturing and its distribution will need to be tightly coordinated and not just harmonious. Our total feed supply service must react to service needs, to real feeding problems and to production economics—including those of feed manufacturing. In order to earn and to hold needed volume, these combined interest reactions must come with at least competitive promptness.

Knowledge and Control

Knowing cost of producing feeding products in different volume and having some control in the shape of responsibility on distribution estimates for expected new item volume will be necessary. This knowledge and this control will be necessary for the economically sound decisions we should make as to whether another feeding item is needed or whether we should drop some old ones.

It has seemed to those of us in manufacturing that our distribution associates believe they cannot compete unless they offer most items of feed and service that competitors offer. Cooperative supply services are particularly prone to this position. We need to service the items which are honestly multiplied because of real needs for different forms or use of different drugs during different stages of growth cycles. We doubt that we need to multiply these items because of different opinions about formulation or because of the relative effectiveness of competitive salesmanship and advertising.

Demandingly tough specification purchasing—the kind of buying that does no supplier any favors nor makes any friends with farmers' money and the kind that uses the leverage of volume to fullest advantages—will continue to be necessary. As will linear programming for the best balance of nutritional availability with economic advantage where ingredient constitutes 86-90% of our wholesale prices of formulated product.

We may also see automated accounting tying together orders with credit checking, inventory control, production scheduling and loading. We are more than willing to accept the warning about the double handling, cost disadvantage of bulk relay stations. They should be volume-efficient feed mills.

We are still responsible as cooperative feed purchasing's employees for attaining its objective for the account of animal agriculture. This responsibility continues in spite of revolution in the slap-dash organization and economics of this kind of farming. We now doubt that we can channel this revolution into the same course with which we came close to reaching cooperative feed purchasing's objective in our pre-revolutionary period.

"Look Ahead and Choose"

We definitely need, therefore, to look out ahead and choose the forward course which is now most likely to improve net returns for feeding poultry and livestock. We need to be cautious about changing course just for the sake of change. But we should at least recheck the pros and cons of our accepted choice against other means which are now currently available for attaining this objective of ours.

We can't refuse to contemplate cooperative feed purchasing's future. It's not divinely nor economically ordained to minister to animal agriculture or to survive. If it survives, it will survive for what it contributes to animal agriculture's economic efficiency.

We believe that the specialized-volume, growth-processor of poultry and livestock will see the economic advantage of cooperation on his feed supply. Where feed manufacturers, cooperative or proprietary, fail to respond to the needs of this specialized volume feeder, however, he is certainly in better position to integrate the manufacture of his feed within his operation than the kind of feeders we've known.

Summary

In summary, then, our view from the manufacturing position sees need for rechecking to take advantage of changes now possible and advisable in the strategy being used by cooperative feed purchasing for reaching its

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goal. It looks like these reconsiderations might include:

1. More competitively tight coordination of efficient feed manufacturing with efficient, specialized distribution and less duplication and miniaturization of cooperative feed manufacturing investments.

2. Expectation of even less return on future farmer cooperative feed supply service investments toward more return on farm feeding operations.

3. More emphasis on competitively efficient poultry and livestock production for market demand.

4. More work in the selling of feeding's end-product and less consumer-type gimmickry in feed supply distribution.

During the five years ahead, cooperative feed purchasing, as a service industry or as a service division, will attain its objective by supplying more efficient feeds as a processing supply to a more totally efficient animal agriculture.

Brooder Firm to Move

ROGERS, ARK. — The Grimm Brooder Manufacturing Co., Toms River, N.J., plans to move its brooder manufacturing operation to Rogers.

A company announcement said the firm expects to begin construction of a new 22,000 sq. ft. factory sometime in April and will begin operations about July 1.

The factory will be located on land the firm purchased in an industrial area from the Rogers Chamber of Commerce.

FEED BUSINESS STARTED

BRISTOL, S.D. — A new firm, Hansmeier & Son, Inc., has been organized here to handle feed, seed, implements and farm machinery. The firm is capitalized at $1 million and directors are Henry F. Hansmeier and Ralph H. Hansmeier of Bristol and G. W. Townsend of Minneapolis.

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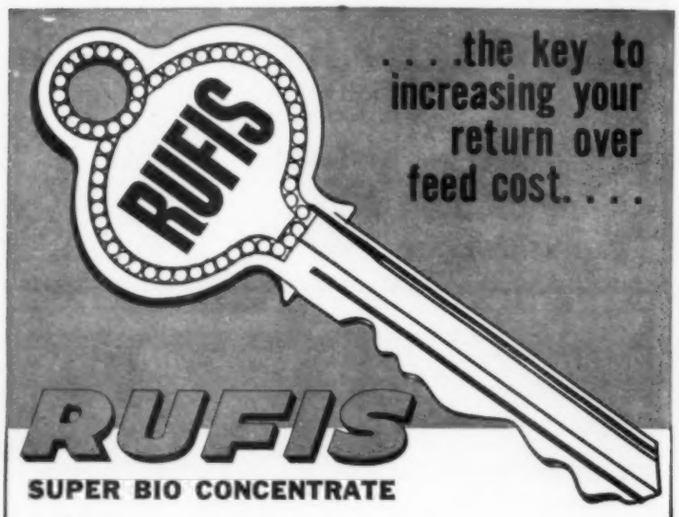

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POULTRY CONGRESS PLANNERS—Executive committee members of the U.S. Participation Committee for the 12th World's Poultry Congress are looking forward to the 1962 congress in Sydney, Australia. Shown mapping plans for the event at a meeting in Chicago, are, left to right, seated: Dr. A. W. Jasper, Chicago, secretary; O. A. Hanke, Mt. Morris, Ill., treasurer; Dr. Hans Lineweaver, Albany, Cal., vice chairman; and Dr. Cliff D. Carpenter, Laguna Beach, Cal., chairman. Sub-committee chairmen standing are from left: Alfred N. Schwartz, Vineland, N.J., publicity; Joseph O. Parker, Washington, international trade development; H. E. Drews, Springfield, Mo., tours; and Lee Campbell, Chicago, exhibits. The group will meet next during the Fact Finding Conference in Kansas City, Feb. 10-12.

Dangers of Crotalaria Seed Defined

WASHINGTON — Considerable information on the dangers of crotalaria seed came out of recent meetings of the Grain & Feed Dealers National Assn. staff, National Committee on Uniform Grades, representatives of the Food and Drug Administration, U.S. Department of Agriculture Grain Division representatives and other interested personnel, GFDNA reports.

GFDNA said it does not intend to develop a scare program because of the meetings but it is providing members with the latest information to protect their business interests.

It was emphasized by the association that crotalaria is a problem mostly in the Southeast and that there is no need for alarm in other sections of the country.

The association advised that if suspicious seeds are found, careful examination is needed for correct identification. It was stated that velvet leaf (known in some areas as butter print or Indian mallow) is brown or black and kidney-shaped but usually less glossy than crotalaria.

Questions and Answers

Questions and answers on crotalaria follow:

Question: What is crotalaria and why is it dangerous?

Answer: Crotalaria is a plant which has been rightly described as "friend turned foe." Of its more than 600 species, only two are of economic importance in this country. The plant was first brought into the U.S. in 1885, but it took the depression of the 1930's to bring out crotalaria's importance as a summer-growing, soil improving cover crop for the Southeast.

Q. Why is crotalaria dangerous?

A. Scientists have known that crotalaria has a toxic factor, but this toxicity was no problem until the introduction of completely mechanized harvesting methods in the Southeast during the past two years. The toxicity of crotalaria will kill livestock and poultry. Although most losses have been in the poultry industry, reports indicate that horses, cows, pigs, sheep and goats are susceptible. Both the plant itself and its seeds are toxic.

Q. How dangerous is it?

A. A level of 1% in a broiler ration will kill chicks in 10 days. As little as 0.5% will kill chicks in about two weeks. Studies show that 2/10 of 1 lb. per ton or about 1/100th of 1% will be toxic to chickens. Livestock losses have been few, but one farmer reportedly lost his whole herd.

Q. How does crotalaria get into feed?

A. Crotalaria seeds have been found primarily in corn and soybeans. Mechanical picker-shellers seem to be a primary method of get-

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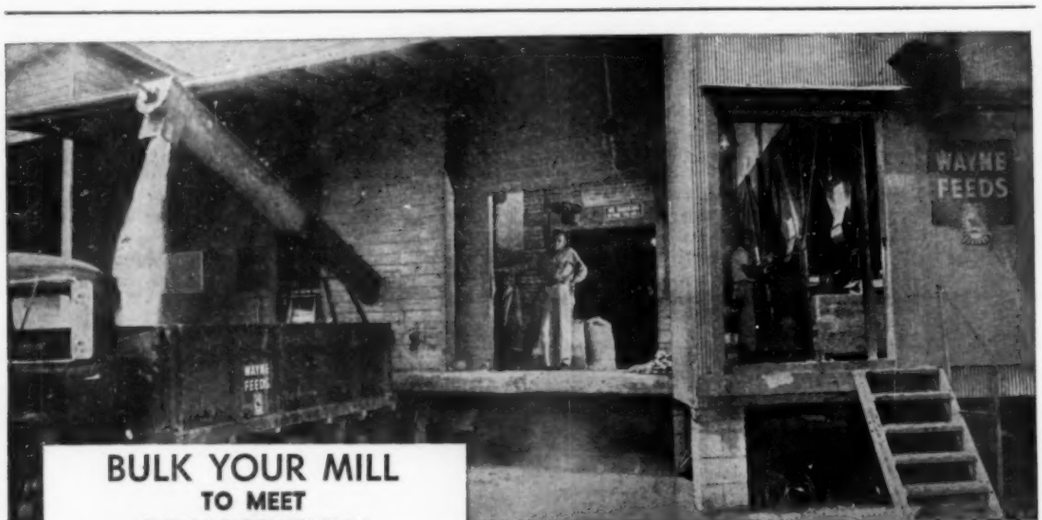

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ting crotalaria seeds mixed with corn. Hand picking can control the corn problem, but there is no similar answer for soybeans.

Q. What is the level of tolerance?

A. The 38 cars seized by FDA were contaminated with crotalaria at a rate ranging from 1½ to 351 seeds per pound. The safe level of toxicity seems to be below 0.5%. In other words, there is no degree of tolerance at present, but FDA has not seized, and there is no reason to believe it will seize, grain contaminated with less than one seed per pound.

Q. Can crotalaria seed be cleaned?

A. Yes, but it is rather expensive. North Carolina recommendations are: "Screen with a rectangular opening of 6/64 by ¾ or 7/64 by ¾ in., depending on the thickness of the crotalaria seed, and used as a bottom screen will drop both species of threshed crotalaria. When cleaning grain containing only C. striata (small-seed variety), a smaller opening may be used as 5/64 by ¾ in. or possibly one as small as 1/14 by ½ in., depending on the thickness of the contaminating crotalaria seed. A screen with round openings also may be used, but the cleaning loss is usually greater than when using a screen with a rectangular opening just large enough to drop the crotalaria. A round opening 8½/64 in. in diameter will drop C. striata, but a larger opening 9½/64 in., is required for screening out the large seed variety, C. spectabilis.

"Cleaning losses will vary from lot to lot, depending on the amount of the foreign material in the grain. To keep the cleaning loss at a minimum, do not use air blast, suction fan or scalper."

Feed mills in the South have started a policy of cleaning corn twice, instead of once. This, of course, adds to labor costs and shrinkage.

Q. What is FDA's policy?

A. Food and Drug Administration will allow the cleaning of grain after it has been seized by FDA inspectors.

Q. What about the grain standards?

A. The official grain standards of the U.S. are expected to be interpreted to provide that grain containing crotalaria will be graded "Sample Grade."

Q. How much is lost financially when crotalaria-contaminated grain is found?

A. This depends on many circumstances: Was it caught by a grain firm and cleaned? Was it caught by FDA, involving court costs and attorney fees? Were additional shipping costs involved? These and other factors can add up to a considerable loss.

Q. What is being done to stop the growth and spread of crotalaria?

A. Everything possible. Land-grant colleges are encouraging farmers to get rid of the plant and, of course, stop planting it as a cover crop. But there is no easy way to eliminate the pest.

Some seeds are "hard seed" and may remain dormant in the soil for many years.

The southeastern states are putting top priority on this problem. It seems that crotalaria is being eliminated in corn, but the problem may continue in soybeans.

Officials agree that the problem can best be solved by educating the grower and the processor to deal with it.

In closing, the association advised members that they could aid their industry tremendously by helping to eliminate this threat.

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Research Progress with Cottonseed Told

NEW ORLEANS—The growth rate of animals fed cottonseed meal is closely correlated with the amount of lysine present in the meal, Dr. V. L. Frampton of the U.S. Department of Agriculture's southern utilization research and development division in New Orleans, told participants at a conference on cottonseed protein for animal and man in New Orleans.

Dr. Frampton said that gossypol did not show any measurable effects on growth rate, but he emphasized this does not mean it does not have harmful effects. He said the results reported were based on cooperative feeding tests involving some 65 different cottonseed meals, and about 15,000 animals, including broilers, swine and protein-depleted rats.

The test for lysine, developed by Dr. Frampton and his group, was acknowledged by the conference to be the most practical and accurate yet devised.

Dr. C. M. Lyman, Texas A&M College, told the conference that heating cottonseed in an excess of water does not reduce the protein value of the meal, and may even improve it.

Dr. Richard A. Phelps, assistant director, research and educational division, National Cottonseed Products Assn., presented data on the feeding of rats, chicks and pigs to show that cottonseed meal with added lysine gave much better results than unsupplemented cottonseed meal. Recent information, he said, lends further support to the belief that wherever poor growth in nonruminants was observed, it was due to inadequate consumption and a deficiency of lysine, rather than to any "toxic" manifestation of gossypol. Pigs fed cottonseed meals supplemented with 0.3% L-lysine gained 60% more than those receiving the unsupplemented meal.

In other tests, gains varied 30% to 113% when L-lysine was added to the meal. Similar results were obtained with chicks and rats. The animals also consumed larger amounts of feed when lysine was added.

Heat Alteration

Need for rapid, accurate analytical methods to measure the nutritive value of proteins was emphasized by Dr. Jean Mauron, Nestle Co., Vevey, Switzerland, who said the first of the amino acids to be altered by heat during processing is lysine. Accurate determination of lysine in a protein before and after processing should therefore give an evaluation of heat damage to proteins.

He pointed out that usual lysine determination after acid hydrolysis does not give the true amount of lysine actually available in the heated protein, but the measurement of epsilon amino lysine more closely reflected the available lysine. He described another method, using digestive enzymes which gave results correlating closely with biological tests.

Small amounts of propene ring fatty acids in cottonseed meal may exert appreciable effects on the nutritive value of the meal, A. B. Kemmerer of the Arizona Agricultural Experiment Station, told the conference. He said that compounds containing these acids fed to laying hens increased the tendency toward discoloration of the eggs, and small quantities also decreased the hatchability.

A new method of extraction with an acetone-hexane-water mixture to produce cottonseed meal with a low gossypol content and high nutritive value was described by T. H. Hopper of the southern division.

Conference participants were also told that cottonseed flour mixtures were very effective in preventing or treating kwashiorkor, the disease brought on by severe protein deficiencies. It was reported that at normal and high levels of intake, children did as well on the vegetable protein mixture as on milk.

The conference was sponsored jointly by UNICEF, the National Cottonseed Products Assn., and USDA's southern division.

TOP TURKEYS—Both the grand champion and the reserve grand champion turkeys in the Pennsylvania Poultry Federation Farm Show this year were fed Hornco Feeds, according to word from Donald E. Horn, sales manager for D. E. Horn & Co., Inc., York Pa. In the center of the photo above holding the reserve grand champion bird is Paul Konhaus, Mechanicsburg, Pa., grower of the bird. On the left is Earl Gingrich, D. E. Horn & Co., Inc., representative, and at the right is Beverly Heath, Benton, Pa., Pennsylvania Poultry Queen. The grand champion bird was purchased by Penn-Harris Hotel, Harrisburg, Pa., for $15.75 lb. or $315, and reserve champion was purchased by the feed company for $9 lb. or $225. Half of the selling price went to the federation and half to the grower. The Horn firm reports that it donated the reserve champion bird to the York Children's Home.

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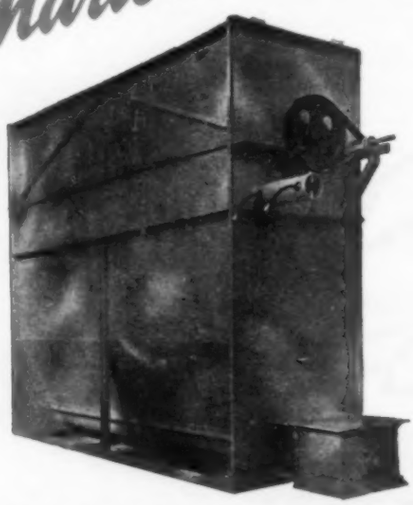

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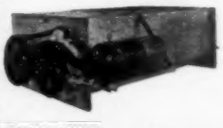
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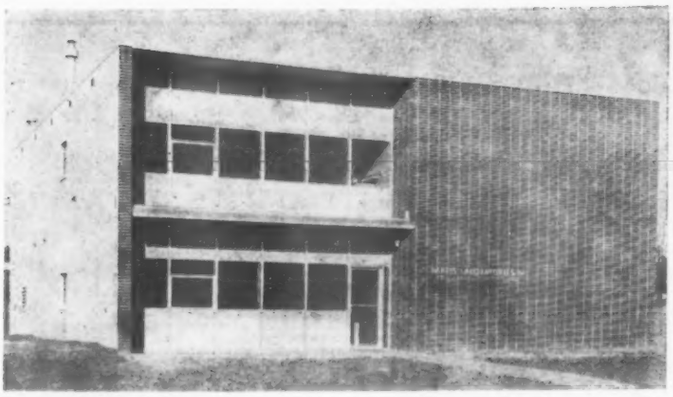

NEW LABORATORY—Harris Laboratories, Inc., Lincoln, Neb., recently completed construction of the new office and laboratory building pictured here.

Harris Labs Completes Lincoln, Neb., Facility

LINCOLN, NEB.—Construction of a new office and laboratory building for Harris Laboratories, Inc., has been completed and the company has moved to this new plant. Announcement of this expansion was made by the firm's president, Lewis E. Harris.

The new, two-story structure is divided into office area and laboratory units for experimental pharmacology, research and development, microbiology, instrumentation, toxicology, agricultural chemistry, and food and drug activities.

The firm, one of the Midwest's largest independent research, development and testing laboratories, employs over 20 scientists and technicians. A branch laboratory is located at Lexington, Neb., and research farm facilities are established near Roca, Neb. An office is also maintained in Mexico City.

Mr. Harris stated that several staff scientists would be added this year to provide new specialized research services in drug research, agricultural product and by-product utilization, as well as radio-isotope facilities.

California Turkey Meat Test Completed

MODESTO, CAL. — California's Poultry Improvement Commission has completed its fifth California Official Random Sample Turkey Meat Production Test.

The commission noted that current interest in the trials is at a high level as evidenced by several criteria including a longer list of persons requesting reports.

Comparing the five tests, the commission said a number of interesting observations become apparent. They include:

(1) There has been a steady increase in the number of white entries from one to seven, possibly paralleling a change in commercial interest among breeds.

(2) The average weight of toms has advanced. It is difficult to estimate a change in average hen weight because of reduction in the number of weeks to market age for this sex.

(3) Average yearly death loss has declined.

(4) Feed conversion has improved, due partially to the marketing of hens at 23 and 22 weeks, respectively, for the fourth and fifth tests, instead of at 24 weeks as was the case for the first three tests.

(5) Although there has been no drastic variation in meat value, and in spite of a continuing rise in feed price, income over feed cost has shown an improvement from the second to fifth tests. The greater income figures for the first test appear to be due to the higher meat value and lower feed cost for that year.

(6) Statistical analyses suggest that the replicate groups of the fifth test did not parallel each other to quite the same extent as those of the fourth test. However, uniformity in body size among birds within an entry for the past three tests remained relatively constant.

TABLE 1. California Official Random Sample Turkey Meat Production Tests

Number of entries	First	Second	Third	Fourth	Fifth
Bronze	19	18	17	15	12
White	1	2	3	4	7
Breed cross				1	1
Average weight:					
Toms, lb.	26.4	26.0	27.2	27.4	27.6
Hens, lb.	15.2	15.1	15.5	15.3*	14.7***
Eviscerated yield:					
Toms, per cent	82.6	80.4	79.5	83.4**	84.1**
Hens, per cent	80.8	78.5	80.0	82.7**	82.9**
Livability, one day through test, %	91.5	91.9	94.2	94.5	94.7
Feed conversion ratio	3.9	3.9	3.9	3.6	3.5
Grade A meat value per lb. (eviscerated)					
Toms, cents	28.5	25.8	27.0	26.4	28.3
Hens, cents	32.2	30.0	29.3	28.4	29.8
Feed cost per cwt., dollars	3.44	3.57	3.65	3.76	3.87
I.O.F.C. per 100 poults started, dollars	199.72	130.78			
I.O.F.C. per 100 poults at 2 weeks, dollars			152.19	172.32	193.44

*Hens processed at 23 weeks (first three tests at 24 weeks).
**Birds weighed after 24 hours in slush tank (first three tests hot weight).
***Hens processed at 22 weeks.
I.O.F.C.—Income over feed costs.

Elect Poultry President

TEMPE, ARIZ.—T. C. Abbott of Tucson is the new president of the Arizona Poultry Federation. Mr. Abbott was elected at the recent ninth annual meeting of the federation at Tempe. He was president of the Southern Arizona Poultry Federation last year.

Other officers elected were Seymour Hesche, Mesa, and Dr. Al Kurnick, head of the poultry science department, University of Arizona.

ELEVATOR REMODELING

STANLEY, N.D. — An extensive remodeling job has been underway the past few weeks at the Occident Elevator Co. in Stanley.

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PENB Plans Consumer Marketing Talks for April 10-12 Meeting

CHICAGO—"We can learn a lot from others." The "others" will be some of the nation's foremost authorities on the best ways to move more food products from the farm to the family table.

The occasion will be the 21st annual meeting of the Poultry & Egg National Board in Chicago's Sheraton Towers Hotel, April 10-12, Ralph J. Thomas, PENB president, announced. Stressing the theme, "Patterns for Champions," the three-day event will provide ideas on getting more eggs and poultry meat products to consumers at a greater profit by presenting behind-the-scene techniques used by related industries.

A highlight of the program will be a homemakers' panel which will provide the industry with a down-to-earth consumer-oriented approach on getting acceptable products into the market place. Developed with the assistance of Jack Bolster of McCall's Magazine, the panel will feature homemakers from McCall's panel of the "Congress of Better Living," one of the nation's barometers of consumer opinion.

Program Planning

In planning the program, five specific industry needs are highlighted, stated Lloyd H. Geil, PENB general manager. They are:

"1. To give to industry basic reasons why homemakers buy or don't buy our products, for the purpose of providing a more realistic pattern for strengthening promotion and merchandising programs.

"2. To reveal promotion techniques used by other related commodity interests for boosting sales and profits.

"3. To focus national attention on the competition industry faces in the market place and thereby place emphasis on more aggressive sales programs.

"4. To stimulate imagination and leadership in planning for industry's future.

"5. To give industry a clearer understanding of PENB's expanding service programs for its growing membership."

Another major feature will be the presentation of case histories on how competing and related foods have climbed in sales as the result of unique promotion and merchandising programs.

Among the outstanding speakers on the program will be Dr. Earl L. Butz, dean, school of agriculture, Purdue University, who will outline important steps which should be taken now to increase the use of eggs and poultry meats in his talk, "Hurdles to Cross." Another outstanding speaker will be Dr. Harrell DeGraff, professor, food technology, Cornell University, who will discuss the important role of consumer attitudes toward food products in building lasting food habits.

Progress Reports

A progress report of major significance will come from Dr. L. G. Maison, president of the advertising agency carrying on PENB's nutritional advertising program in 13 journals directed to the nation's 300,000 physicians, nutritionists, nurses and dietitians. The program is designed to focus the attention of professional groups on the remarkable nutritional value of eggs and on their easy and complete digestibility for people of every age.

Progress reports will be made on PENB's growing membership and on its expanded program of research, consumer information and promotion.

The annual meeting program is being planned by a 15-member industry committee headed by Howard Kauffman, PENB first vice president, and the PENB professional staff.

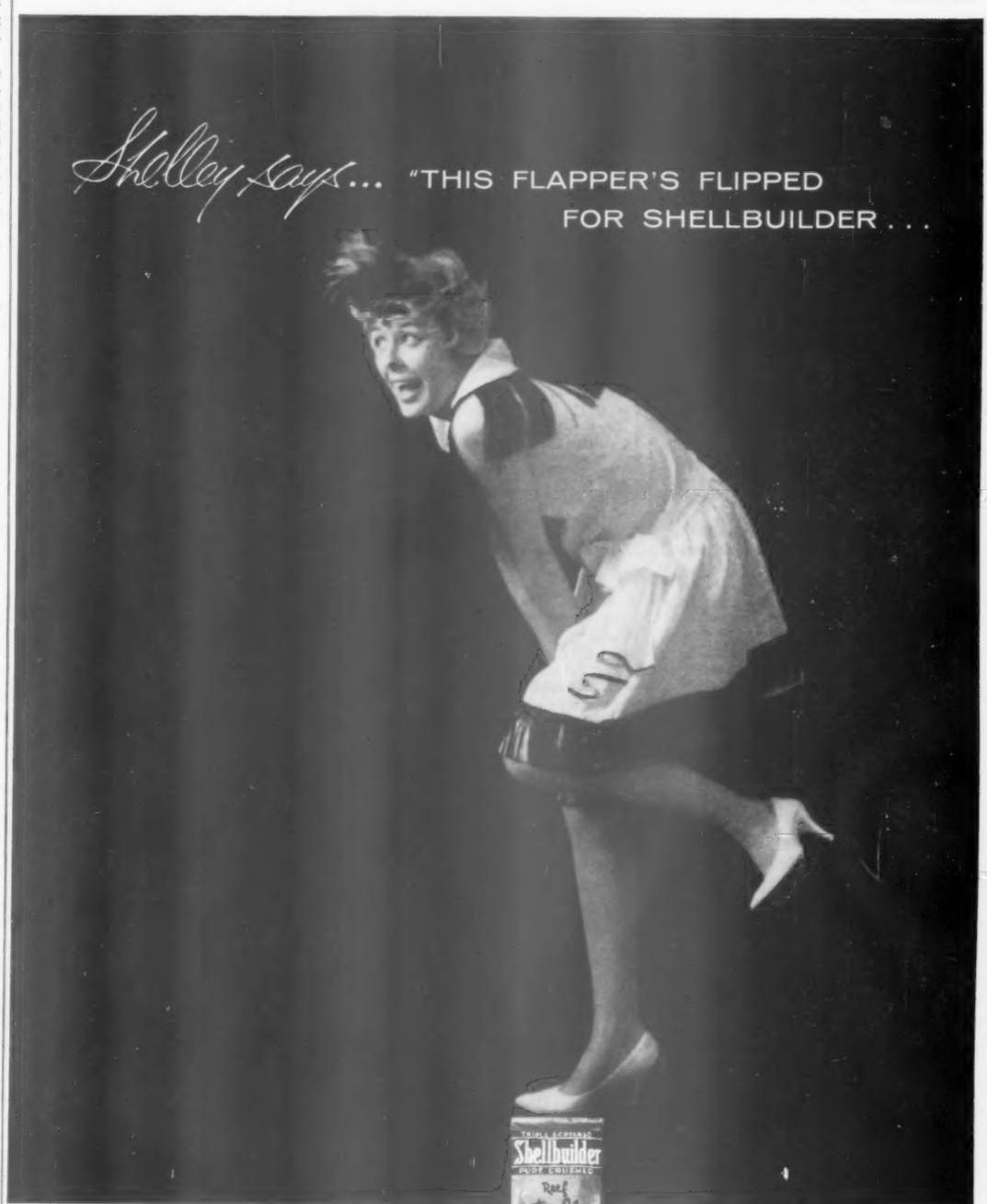
Mutual Millers Meet March 8; Program Told

BUFFALO, N.Y. — The Mutual Millers & Feed Dealers Assn. will hold its mid-winter convention in the Statler-Hilton Hotel, Buffalo, Mar. 8.

The morning session will feature Dr. L. C. Cunningham, department of agricultural economics, New York College of Agriculture, Cornell University, Ithaca, who will speak on "Changes in Commercial Feed Distribution."

The luncheon speaker will be Samuel Golden, Amburgo Co., whose talk will be entitled "I Own Shares in America." In the afternoon, Dr. Paul A. Beaver, Continuing Education Services, Pennsylvania State University, University Park, will discuss "The Most Important Problem in the World." Dr. Beaver's talk will include a discussion of the importance of good management in the future and some of the trends which will affect business, as well as the nature of the management function.

The one-day program also will include a panel discussion by members, both suppliers and independent feed dealers. A social hour is planned for late afternoon.



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No. 7320—Feed Handling

Sprout, Waldron & Co. announces the availability of a booklet by R. L. Stroup on the subject of "Liquid Handling as Related to Mixing." This booklet was presented to the 1960 Feed Production School in reprint form.

For a copy of this booklet, check No. 7320 on the coupon and mail.

No. 7319—Hanging Waterer

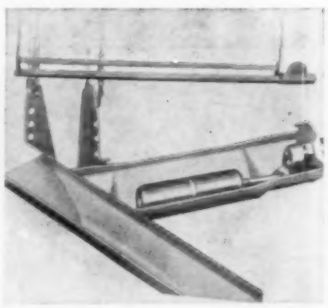
The Oakes Manufacturing Co., an operation of the Ford Machinery & Chemical Corp., announces the availability of a new No. 1672 hanging-type waterer known as the "Drinker."

The waterer comes in two models, with a reel guard or with a wire guard. The trough length is 6 ft. and the over-all length including the float end measures 81½ in.

A new hard vitreous glaze porcelain finish covers the entire waterer and seals all metal pores against acids and minerals. Extra heavy gauge metal with porcelain finish has new durability and lasts for years, claims the company.

The "Valley-Type" trough is made from heavy 14 gauge steel, extremely rugged and sturdy and one end of the trough has a "sweep-out" design for easy cleaning, it is reported.

A positive float valve insures that water level is controlled at all times.



Stamped depression in float valve end of trough holds the pencil styled float for free and accurate valve action, officials state.

Over-all dimensions are 2⅞ in. wide, 1¾ in. deep, trough is 6 ft. long and over-all length with float end is 81½ in. Each hanging waterer comes complete with "S" hooks and two 8 ft. lengths of sash chain.

For additional information, check No. 7319 on the coupon and mail.

No. 7321—Bag Closure Equipment

West Virginia Pulp & Paper Co. announces the development of modification equipment that will permit manufacturers and users of multiwall bags to apply the 4-ply, double-strength sewn closure Impactape in their own bag plants.

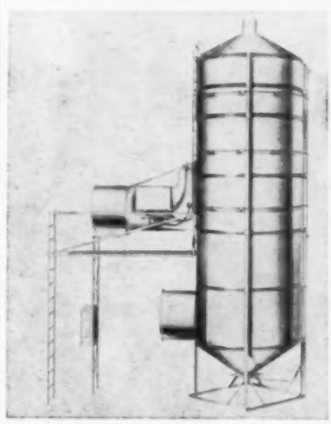
The company reports that the Impactape modification equipment has been specially designed for both H and E heads of Union Special Series 80600 sewing machines.

The company is offering Impactape modification equipment to bag users and manufacturers. For additional information, check No. 7321 on the coupon and mail.

No. 7314—High Flow Dryer

The ACE Supply & Equipment Co., Inc., announces the national availability of the ACE high dryer, produced and sold initially in Kansas and Missouri.

Features include expansion capabilities by adding modular elements,



push-button operation and complete safety shutdown and alarm.

The manufacturer reports that ACE high dryers are available in three sizes from 250 to 600 bu. per hour drying capacity.

For additional information, check No. 7314 on the coupon and mail.

No. 7313—Oats Filmstrip

The Seedburo Equipment Co. announces the availability of a new 35mm filmstrip entitled "Grain Inspection Methods for Oats."

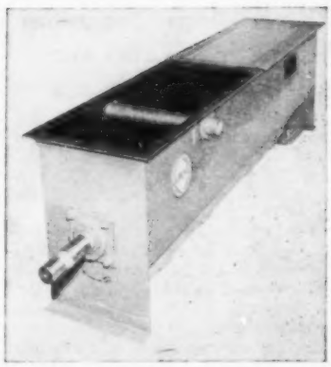
This new educational color film and lecture booklet was prepared by James R. Enix of Oklahoma State University in cooperation with the U.S. Department of Agriculture and Seedburo.

A series of color filmstrips with lecture booklets and recorded transcriptions on corn, wheat, soybeans and grain sorghums are also available. For additional information, check No. 7313 on the coupon and mail.

No. 7318—Molasses Blender

The S. Howes Co. announces introduction of a single cylinder molasses blender which it claims will provide perfect blending of molasses and fats and oils for smaller custom-mix feed mills.

The new Eureka blender, Model 61, has a 6-ft. long tub with a 15-in. diameter. The shaft is equipped with the same patented loop-type paddles used in the large Eureka duplex agitator mixer. By adjusting the paddles from zero to 45 degrees from the perpendicular to the cycinder shaft,



the movement of the mixture through the blender can be speeded up or retarded, to obtain any desired results, company officials report.

Dry feed is introduced at one extreme end of the blender and propelled by the loop-type paddles to the other end, where it is discharged. The molasses is introduced just beyond the feed inlet, allowing the full length of the mixer for thorough blending. The mixer tank is equipped with drop-bottom cleanout doors, it is reported.

According to Georgie R. Willis, vice president of sales for S. Howes Co., the new Eureka single cylinder blender produces perfect blending without molasses balls, at high tonnage per horsepower applied. For additional information, check No. 7318 on the coupon and mail.

No. 7312—Vertical Feed Mixer

A vertical feed mixer supposedly designed to prevent clogging, bridging or fluffing of materials is announced by SECO, Inc., manufacturers of stationary and mobile feed processing equipment.

The SECO vertical mixer was designed for high capacity work with a minimum of power and the unit may be connected in parallel for large operations, the company reports.

It is claimed that the lightest feeds as well as the toughest roughage may be mixed with ease. Officials say that SECO agitator bars insure faster, more thorough mixing of all formulas.

A heavy-duty shaft and electronically-balanced screw conveyor mounted with anti-friction bearings, provides quiet and trouble-free operation, it is claimed. Dust control is maintained in the mixer right down to the bagger.

A special slide gate is metal-enclosed and the bagger provides easy and positive control, officials state.

Constructed of rugged all-steel "single-unit" design, the SECO vertical mixer is delivered as a single unit. Capacities of the models offered range from 1 to 2 tons.

For additional information, check No. 7312 on the coupon and mail.

No. 7316—Grain Viewer

Gerber Sheet Metal, Inc., announces the introduction of a grain viewer that uses a special light and angled mirror to expose both sides of a grain kernel at once.

The firm claims that this grain viewer will speed up grain sampling and produce a more accurate picture of quality. To use, sample kernels are spread on plate glass viewing surface and light turned on.

Officials report that the grain view-

Send me information on the items marked:

- ☐ No. 7310—Dust Suppressor
- ☐ No. 7311—Sample Extractor
- ☐ No. 7312—Vertical Feed Mixer
- ☐ No. 7313—Oats Filmstrip
- ☐ No. 7314—High Flow Dryer
- ☐ No. 7315—Merchandising Tool
- ☐ No. 7316—Grain Viewer
- ☐ No. 7317—Industrial Mills
- ☐ No. 7318—Molasses Blender
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er is especially adaptable for use with corn, but can be used with other grains. It plugs into any 110 volt outlet. For additional information, check No. 7316 on the coupon and mail.

No. 7311—Sample Extractor

A new sample extractor is now available for quality control or testing programs, according to announcement by Testing Machines, Inc. The extractor is used to take samples from deep within shipping sacks, bags, bales and containers.

It is reported to be rust-proof, corrosion resistant, light weight and simple to operate. Company officials

say that with a flick of the wrist, the sample is contained within the sampling chamber, ready for inspection. It can be liquid, granular or powder.

Two models go to a maximum depth of 24 in. or 48 in. with sampling chamber sizes of 2 x 15/16 in. or 6 in. x 2 in.

For additional information, check No. 7311 on the coupon and mail.

No. 7310—Dust Suppressor

The Daffin Corp. announces introduction of a discharge dust suppressor that it claims will practically eliminate all the dust that comes out of the end of the discharge tube of pneumatic unloaders.

The company claims that use of the Daffin discharge dust suppressor permits indoor or outdoor use of the pneumatic unloader.

Called the "Cyclone," company officials say that feed drops from the bottom of the small, easily handled dust suppressor unit intead of being blown out of the end of the tube. Feed dust falls into the flow of feed and drops out of the bottom of the "Cyclone" with the feed.

The moving air escapes through the opening in the top of the "Cyclone." No feed dust is lost, the company claims.

For additional information, check No. 7310 on the coupon and mail.

No. 7315—Merchandising Tool

Feed sample bins which will hold approximately 24 samples have been adopted as a new merchandising tool by the Minute Maid Co's. citrus products division.

Photo shows John S. Adamson, di-

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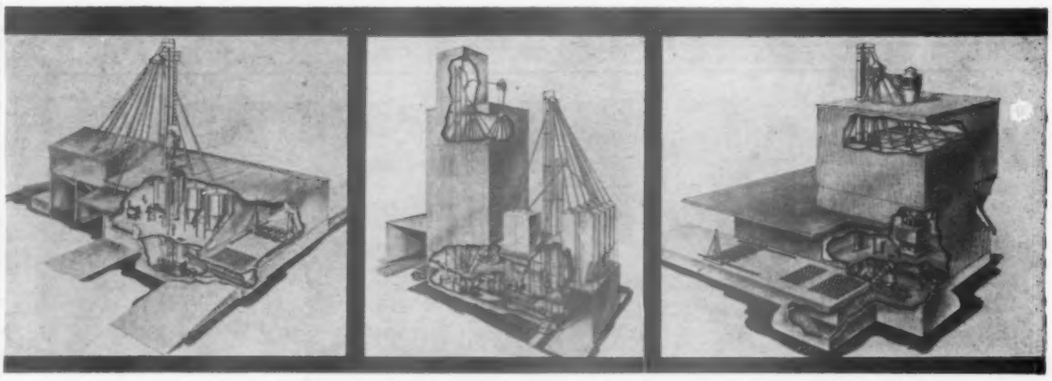

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rector of sales for the citrus products division, demonstrating one of the sample bins which also features a holder for literature above the tray.

For additional information, check No. 7315 on the coupon and mail.

No. 7317—Industrial Mills

The Prater Pulverizer Co. announces the availability of Prater Bulletin PR-60 that describes and illustrates industrial mills for all types of processing problems, from grinding meat scraps to bread crumbs.

Included in this bulletin are Model G5S laboratory mills, limited production grinders and Series C-heavy-duty mills for grinding ceramic materials or any abrasive product.

Also discussed is the Model G6H intermediate mill and the Prater granulator used principally in breaking up water balls or agglomerations of soybean, cottonseed or linseed meal.

For a copy of this bulletin, check No. 7317 on the coupon and mail.

Also Available

The following new products have been described in previous issues of Feedstuffs and information about them may still be obtained by jottmg the appropriate number of the coupon and forwarding it to Feedstuffs.

No. 7262—Grain driers, Aeroglide Corp.

No. 7263—Compact trucks and tractors, White Motor Co.

No. 7264—Steam generator, Clayton Manufacturing Co.

No. 7265—Self-feeder for cattle, The Brower Manufacturing Co.

No. 7266—Iron for pigs, Specifide, Inc.

No. 7267—Round nursery pens, The Walsh Manufacturing Co.

No. 7268—Plastic bag handle, Union Bag-Camp Paper Corp.

No. 7269 — Feed bagger, Thayer Scale Corp.

No. 7270—Poultry supplies, The Anderson Box Co.

No. 7271 — Belt splice, General Splice Corp.

No. 7273—Poultry plant cleaning compound, Anderson Box Co.

No. 7274—Bad debt collection system, Transco Envelope Co.

No. 7275 — Lift truck handbook, The Automatic Transportation Co.

No. 7276—Turkey barn insulation, The American Sisalkraft Co.

No. 7277—Round hog feeder, The Oakes Manufacturing Co.

No. 7278—Variable speed drives, Western Gear Corp.

No. 7279 — Terramycin for milk production, Chas. Pfizer & Co., Inc.

No. 7280—Pellet cooler and dryer, Archer-Daniels-Midland Co.

No. 7281—Bin monitor, The Rolfes Electronics Corp.

No. 7282—Hog health products, Dr. Salsbury's Laboratories.

No. 7283—Packaging for poultry medication, Abbott Laboratories.

No. 7284—Mobile feed mill, Daffin Manufacturing Co.

No. 7285—New pig brooder, Nutrena Mills, Inc.

No. 7286 — Mobile mill extension loader, Seco, Inc.

No. 7287—Cellulase enzyme, Miles Chemical Co.

No. 7288—Grain weighing systems, Howe Scale Co.

No. 7289—Feed mix for grub control, Dow Chemical Co.

No. 7290—Poultry disease bulletin, Dr. Salsbury's Laboratories.

No. 7291—Grain dryer lease plan, Daycom, Inc.

No. 7292—Egg room cooler, The National Ideal Co.

No. 7293 — Mixer-blender, A. W. Stauffer & Sons, Inc.

No. 7294—Fertilizer spreader, The Henderson Manufacturing Co.

No. 7295—Poultry and livestock equipment, Brower Manufacturing Co.

No. 7296—Bulk truck bodies, FMC Bulk Transport Systems.

No. 7297—Ketosis medication, Sheffield Chemical Co.

No. 7298 — Auto leasing study, Foundation for Management Research.

No. 7299 — Electrical control systems, SEMCO Electric Controls, Inc.

No. 7300 — Mobile pelleting machine, Daffin Manufacturing Co.

No. 7301 — Feed-health program, the American Cyanamid Co.

No. 7302 — Bucket elevator, the Shelby Manufacturing Co.

No. 7303 — Water medication, Dr. Salsbury's Laboratories.

No. 7304—Continuous flow dryer, A. T. Ferrell & Co.

No. 7305—Herd treater, Chas. Pfizer & Co.

No. 7306—Fertilizer spreaders, the Simonsen Manufacturing Co.

No. 7307—Grain dryer, the Rolfes Grain Aeration Co.

No. 7308—Bin ventilator, the Tierney-Gerber Roto Vent, Inc.

No. 7309 — Custom milling brochure, the Prater Pulverizer Co.

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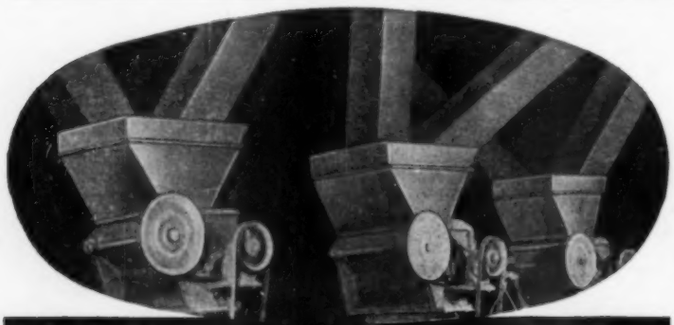

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Livestock Research Results Told at California Event

DAVIS, CAL. — Results of recent research studies pertaining to "all-concentrate" rations for cattle, use of high protein supplements for lambs and other aspects of feeding were presented at the 1961 Animal Husbandry Livestock Day on the University of California campus at Davis.

Among reports made by researchers at the one-day livestock meeting were several of interest to the feed industry. They included the following:

- The feeding of "all-concentrate" rations to fattening cattle can result in good gains on less feed than the more conventional rations.
- Cortisone, a hormone produced in the cortex of the adrenal glands, may some day be used to fatten lambs quickly and economically.
- High protein supplements have increased weight gains and wool production of ewe lambs in feeding trials.
- Hogs that are finished for market on green pasture plus proper concentrates and minerals not only gain more rapidly, but also more economically than those that are finished in dry lot.
- The latest progress in the development of field hay wafering machines was reviewed by an agricultural engineer.

CATTLE RATIONS — Dr. G. P. Lofgreen, associate professor of animal husbandry, University of California, reported on research studies that indicated that the feeding of "all-concentrate" rations to fattening cattle can result in good gains on less feed than the more conventional rations.

Dr. Lofgreen said this finding was confirmed in tests conducted by the University of California Agricultural Experiment Station and extension service at Davis and in the lots of cooperating feeders.

But he cautioned that animals fed such rations require closer supervision and care to prevent digestive disturbances and resultant lowered performance.

In an early small pilot study, Dr. Lofgreen said, 700-lb. steers were changed over from a complete roughage feed to an all concentrate feed of barley and a supplement in 18 days and were fed for a period of 141 days with no serious digestive disturbances. A control lot was fed a conventional ration averaging approximately 25% roughage for the same period.

"The experimental and the control lots gained about 2.75 lb. per day and all graded choice at slaughter," he noted. "There were no differences in carcass composition, but the all concentrate lot yielded 62% while the controls yielded 60%. The feed required to produce a pound of gain was 7.4 lb. for the all concentrate lot, compared to 8.4 lb. for the control lot."

Dr. Lofgreen said the supplement fed to correct the nutrient deficiencies of the barley consisted of the following percentage composition: cottonseed meal, 57; alfalfa meal, 20; molasses, 10; oystershell flour or ground limestone, 7; trace mineralized salt, 6; and 3,500 international units of vitamin A per pound of supplement.

"The average consumption of the supplement was 1.1 lb. per head per day and the rolled barley consumption averaged 18.7 lb. per day," he pointed out, "while the control steers consumed an average of 23.5 lb. of total feed per day."

Dr. Lofgreen said that these results have been confirmed by a number of cooperative field trials using various modifications.

CORTISONE WITH SHEEP—Dr. Glenn M. Spurlock, University of California sheep expert, reported on the use of cortisone, a hormone produced in the cortex of the adrenal glands.

He said that cortisone may some day be used to fatten lambs quickly and economically, but added that its development would be delayed until someone figures out how to produce the hormone synthetically, in large and economical batches.

"In an experiment in which a number of weaned lambs were injected with cortisone, the hormone had little effect on weight gain," reported Dr. Spurlock, "but it significantly increased the carcass fat content and produced a higher carcass grade."

Dr. Spurlock explained that this speeded-up fattening—if proved completely satisfactory by subsequent experiments — would enable sheepmen to market their lambs earlier for a higher price.

In another phase of the investigation, Dr. Spurlock found that the hormone decreased the width of the crimp (waviness).

Further experiments with cortisone are in progress, said Dr. Spurlock. He and Dr. M. Tran Clegg, Davis physiologist, hope to confirm their

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original findings and also to find the most effective dosage.

Injections of another drug, testosterone (the male hormone), proved to be less promising, said Dr. Spurlock. Testosterone reduced the amount of clean wool fiber produced, and—though it increased daily weight gains—the resulting carcasses were leaner and therefore graded lower.

SHEEP FEEDING—Sheepmen attending the Davis animal husbandry day were also told that high protein supplements have increased weight gains and wool production of ewe lambs in feeding trials at the University of California's Hopland Field Station.

This was reported by Dr. W. C. Weir, professor of animal husbandry, University of California.

Dr. Weir told the sheep section audience that trials had been conducted for the past five years to study the most efficient supplements for weaning ewe lambs grazing the native range.

In all the trials, he said, the lambs were grazed as one flock and gathered five days per week for separation into various treatment groups at feeding time.

Dr. Weir related that all supplements were fed at the rate of ½ lb. per lamb per day in the first two trials—July 24 to Dec. 11, 1956, and July 16 to Dec. 2, 1957.

"In both years, the largest weight gains were made by lambs receiving cottonseed meal, followed by those fed 50% cottonseed meal and 50% barley and then alfalfa cut and pelleted at the bud stage," he said. "Alfalfa cut and pelleted at the full bloom stage or barley were not as effective as the higher protein supplements, but all supplements increased the gain over the control lambs."

Dr. Weir explained that at the conclusion of the feeding period, all lambs were grazed together on the Hopland range until the following shearing when they were weighed and data obtained on individual fleece.

Results

"The lambs which had gained less during the supplemented period gained more during the recovery period in both years so that for the combined periods (July to May) the differences were not statistically significant," he said. "The effect of the supplements was reflected in an increased wool production in both trials with the higher protein supplements accounting for the largest boost in wool."

Dr. Weir added that data obtained on those ewes which remained in the Hopland flocks through 1960 do not show any effect of the supplements on wool or lamb production after they were shorn as yearlings.

WAFERING MACHINES—At a farm machinery conference on the Davis campus, a University of California agricultural engineer reviewed progress in the development of field hay wafering machines.

John B. Dobie reported that current models make wafers in many shapes and sizes. "Some are disc shaped, others square and flat, and still others are cubed," he said. "Sizes range from 1 in. cubed to 5 in. in diameter and 1 in. thick. For handling and feeding, the smaller sizes are preferable, but the machine designer usually favors the larger sizes as an aid to increasing capacity."

The U.C. engineer pointed out that the capacities of the models vary from 1 to 5 tons per hour, but this does not necessarily indicate the full potential of these machines. "Undoubtedly, capacity can and will be improved on most models," he said. "Production may be improved by increasing operating speed, providing additional compression devices, enlarging the compression chamber, or improving the waferability of the hay."

Mr. Dobie explained that most field waferers deposit the hay in a wagon which is trailed behind the machine. One uses a bulk bin on the waferer. "Much of the work of the machine can be undone by damage to the wafers in conveying," he said. "Improved handling systems are needed to help reduce the amount of thrash."

15-20% Moisture Best

The Davis expert noted that most models operate best with hay at 15-20% moisture, provided the moisture is fairly uniform. "Most waferers are unable to make a good product above 25% moisture content," he said. Feld wafering may necessitate improved mowing and windrowing management to overcome major variations in moisture content due to uneven raking or other factors.

Mr. Dobie observed that waferers work best with good quality legume hay. "They do not produce a good wafer from grass hay, although a mixture of grass and legumes usually makes a satisfactory product," he said.

The engineer reported that factual information on the results of feeding wafered hay is limited. "Indications are that wafered hay is equal to or slightly better than baled hay, although advantages in feeding usually would not pay for much added cost for wafering," he said. "If wafering costs more than baling, as it probably will, the extra cost will have to be made up mainly through savings in handling and storage costs and in reduced waste."

DAIRY PRODUCTION—Dairymen attending the animal husbandry day at Davis were told that a dairy cow's ability to maintain high milk production through a large portion of any one lactation will probably go down in succeeding lactations whether or not she is affected with mastitis.

In an experiment with a group of mastitis-free cows, Dr. Robert C. Laben, animal husbandman on the Davis campus found that the "persistency" of the group declined naturally as the cows matured and their total production increased.

This finding indicates that factors besides mastitis are important in causing distinct changes in the shape of the lactation curve with advancing age, Dr. Laben told dairymen attending Animal Husbandry Livestock Day.

Dr. Laben found no differences in persistency between the individual quarters, although the fore quarters yielded only two-fifths of the total milk production.

"According to our investigations, persistency is associated with high production," explained the Davis scientist. "The higher the maximum milk production is, the greater will be the drop in production during the lactation."

Dr. Laben's report was the result of a seven-year experiment, conducted with Dr. A. C. Pier of the Davis school of veterinary medicine, using a herd of purebred Holstein-Friesian heifers.

PORK PRODUCTION—To produce pork in California, against the competition of high costs, make full use of green pastures.

That was the advice of Reuben Albaugh, extension animal husbandman,

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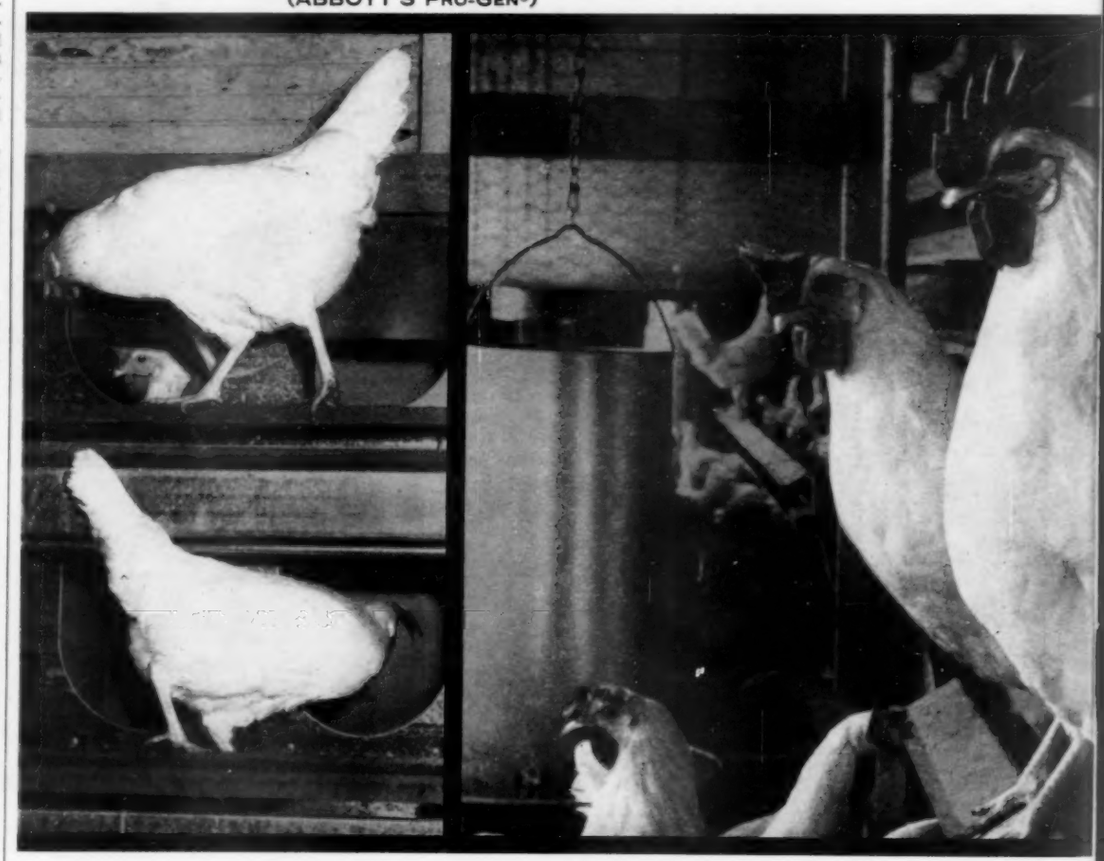

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to swine growers attending the 1961 Animal Husbandry Livestock Day at the University of California.

"Hogs that are finished for market on green pasture plus proper concentrates and minerals," he said, "not only gain more rapidly, but also more economically than those that are finished in the dry lot."

The Davis livestock specialist cited tests over the past 25 years that have repeatedly shown more economical pork production when pigs were fattened on pasture. Alfalfa, ladino clover and green barley pasture were used in the tests.

In an 80-day Monterey County test, he showed a dry-lot group took 410 lb. of feed for 100 lb. of gain, compared to 320 lb. of feed for a group supplemented on alfalfa pasture. The cost spread was $4.50 for the dry-lot hogs to $3.76 for those on alfalfa.

In another test two groups of pigs in dry-lot were fed fresh green cut alfalfa every day. One given a protein supplement gained 1.15 lb. per head daily; one given no protein supplement gained 1.02 lb. per head daily. But cost ran to $13.14 per head for the supplemented pigs and only $12.77 for those receiving no supplement.

"It appears that the efficient swine operator in the future will utilize green pastures to the fullest extent in the production of pork," Mr. Albaugh concluded. "The only salvation for the inefficient operator is high prices."

LAMB STUDIES—Experiments at the University of California indicate that only a small price differential is justified between ram and wether lambs of comparable age and finish.

This was reported by Dr. G. Eric Bradford, assistant professor of animal husbandry on the Davis campus, who also suggested that "discontinuing castration under conditions where lambs are sold fat directly off their mothers at young ages (up to five months) would be a practical means of quickly increasing meat production."

He told the Animal Husbandry Livestock Day audience that these conclusions are based on a two-year study of weight at different ages, dressing per cent, carcass grade, carcass cut-out value and eating quality of the meat in white-face lambs from two flocks.

Rams weighed approximately 10% more than wethers at five to seven months of age and at weights of 80 to 100 lb., Dr. Bradford reported.

Wether lambs were about 1-1.5% higher in dressing per cent at these weights, but because of greater live weights, rams yielded carcasses weighing 2.8-3.8 lb. more than wethers.

Although there was a tendency for ram carcasses to contain more lean than wether carcasses as indicated by larger loin eye area and slightly less finish on the legs, federal carcass grades under the old or new grading systems were not appreciably different between the two groups.

Percentages of total carcass weight represented by leg, trimmed loin and rack were very similar.

No consistent differences in flavor, texture, tenderness or juiciness of either leg or shoulder cuts could be detected between rams and wethers.

ARTIFICIAL BREEDING—Canadian cattlemen, applying modern artificial breeding to herds as large as 1,500 head, have made spectacular changes in beef cattle practices since 1955.

Under widely varied conditions, they have achieved calf crops as high as 95%, Canadian cattle expert Harry J. Hargrave told an Animal Husbandry Livestock Day audience at the University of California.

"The most enthusiastic advocates of artificial insemination are practical commercial ranchmen who have been involved in A. I. on their own ranches for the past three to four years," Mr. Hargrave told California beef growers.

"One of these men recently said that A.I. had produced more improvement in three years than would have been possible in 20 years with natural breeding, using bulls of the caliber he could afford."

In the U.S. the practice is widely used in dairy herds, but little used in the beef industry.

Mr. Hargrave, now chief of the agricultural division for prairie farm rehabilitation in the Canadian Department of Agriculture, said experiences in western Canada indicate that ranchers with cow herds from 50 to 1,500 head can successfully adopt artificial insemination. Hilly, open range in the prairies, brushy sandhills range, mountain valley and timber range all have been involved, he said. Cost of service has varied from $3 to $10 a cow.

Heat Detection Difficult

One of the key factors, he said, is the need for accurate detection of cows in heat. But it has been shown that well-trained, experienced men, with well prepared plans, successfully handle the operation.

In 1960, Mr. Hargrave reported to his California audience at Davis, many encouraging results were obtained in a community pasture project near Kindersley, Saskatchewan. There were 385 cows, owned by 40 pasture patrons. He said an 85% calf crop is now indicated, and the cost was $6 per cow.

"It is now apparent that a well organized A.I. operation can be successful," the Canadian cattle breeder said. "It requires sound planning, coupled with ability to handle both cattle and men. It involves intensive attention to all details concerned, seven days a week, rain or shine, for the period to be covered in the program." The breeding season ranges from 24-60 days.

Mr. Hargrave is widely known for his success in crossing bison with domestic cattle to produce a "cattlo" that is resistant to Canada's cold and blizzards. An 80-head herd of the crosses is now showing promise of increasing beef production in the prairie provinces.

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Minnesota Researchers Report Results of Lamb Feeding Tests

By DR. R. M. JORDAN
University of Minnesota

MORRIS, MINN.—Results of lamb feeding experiments involving a fall cornfield trial and a dry lot feeding trial were reported Feb. 9 at the 34th annual Sheep and Lamb Feeders' Day program conducted here at the University of Minnesota's West Central School and Station. Summaries of these tests, as reported by H. E. Hanke of the experiment station staff, and Dr. R. M. Jordan, University of Minnesota department of animal husbandry, follow:

CORNFIELD TRIAL—Objectives: (1) To determine the value of feeding supplemental grain to lambs that were grazing in standing corn; (2) to determine the amount of yield reduction that occurs when lambs are turned into standing corn, and (3) to determine whether feeding lambs in corn results in as much net profit as feeding comparable lambs in dry lot.

A mixture of three parts of soybean oil meal and one part of salt resulted in about .15 lb. of soybean oil meal being consumed per lamb daily. To minimize labor and amount of bunk equipment necessary, supplemental grain was self-fed to lambs by mixing nine parts of ground corn and one part of soybean oil meal with salt at the rate of six parts of the corn-soy mix to one part of salt. The lambs ate about ½ lb. of this mixture per lamb daily. The level of corn and soybean oil meal consumption may be increased by gradually changing the proportion of salt in the mixture and in a subsequent trial it was found that one part of salt to nine parts of corn-soy mixture resulted in about a 1 lb. consumption per lamb.

Results of the cornfield trial are presented in Table 1. Turning lambs into standing corn on Sept. 1 resulted in 11-13 bu. of corn drop per acre as compared to the check lot that had only 3.2 bu. per acre on the ground after picking.

TABLE 1. Fattening Lambs in Standing Corn
University of Minnesota, 1960

Treatments	——Cornfields—— Salt:soy 1:3	Salt:corn-soy 1:6	Salt:corn-soy 1:6 ½ lb. hay	Dry lot	Check field
Lambs/acre	4.5	4.5	4.5	....	....
Pre-harvest daily gain, lb.	.27	.23	.19	.53	....
Post-harvest daily gain, lb.	.37	.49	.36	.44	....
Total gain, lb.—					
Per lamb	20.7	22.3	17.1	33.2	....
Per acre	93.6	100.8	76.0	....	....
Average daily gain, 67 days, lb.	.31	.33	.26	.50	....
Corn drop, bu./acre	13.1	11.7	11.1	....	3.2
Cost/100 lb. gain	$7.89	$7.49	$9.79	$9.57	....
Profit/lamb	$0.13	$0.84	$0.03	$0.54	....

During the pre-harvest period of 40 days the gains were rather slow, ranging from .19 lb. to .27 lb. per lamb daily as compared to .53 lb. of gain for the lambs fed in dry lot. The relatively poor gains made by the lambs that were fed the corn-soy-salt mixture plus ½ lb. of alfalfa hay per lamb daily were due to some difficulty with the lambs scouring. The feeding of hay also reduced the amount of supplemental grain that the lambs ate, which may have affected their rate of gain.

Post-Harvest Period

During the post-harvest period, apparently the lambs in all the cornfield lots were "conditioned" to picking up corn and the gains were quite satisfactory, varying from .36 to .49 lb. per lamb daily. During the same period the dry lot-fed lambs gained .44 lb. During the entire trial (67 days), lambs fed in the cornfield gained from .26 to .33 lb. per lamb daily while the dry lot-fed lambs gained .50 lb. a day.

The amount of corn that the lambs knocked onto the ground was charged against the lambs at the rate of 50¢ bu. (the corn was high moisture and there was no picking charge). This resulted in producing 100 lb. of lamb gain for $7.49-$9.79 cwt. among the lambs fed in the cornfield. We can contrast this with $9.57 gain in dry lot. However, the amount of gain made by the lambs in the cornfield amounted to 17-22 lb. per lamb, whereas the dry lot-fed lambs gained 33.2 lb. per lamb. This greater gain, even though it was made at somewhat higher cost per pound, resulted in more profit on the average than the lambs pastured in the cornfield.

DRY LOT FEEDING TRIAL—Ten lots of lambs were fed eight different rations or systems of feeding with three general purposes in mind: (1) To determine the relative value of pelleted oats or barley; (2) whether corn cob can be used as a source of roughage in a lamb fattening ration, and (3) an attempt was made to develop a system of self-feeding that would minimize the length of time that a pelleted ration need be fed or eliminate the need for grinding and mixing the hay and roughage.

The last method was accomplished by self-feeding a mixture of ground corn and soybean oil meal that had been mixed with salt in the ratio of 6 to 9 parts of the grain mixture to one part of salt. This level of salt was gradually reduced over a 28-day period and finally eliminated. An abbreviated summary of the results of the trial are presented in Table 2.

Effect of Pelleting

Pelleting either oats or barley did not result in as great a gain as when a conventional long hay-shelled corn ration was fed. Daily feed consumption per lamb rose to 5 lb. of the oat or barley pellet along with about ¾ lb. of long hay. Since their gains were less, it cost decidedly more to produce 100 lb. of gain with that type of ration than it did with a conventional ration.

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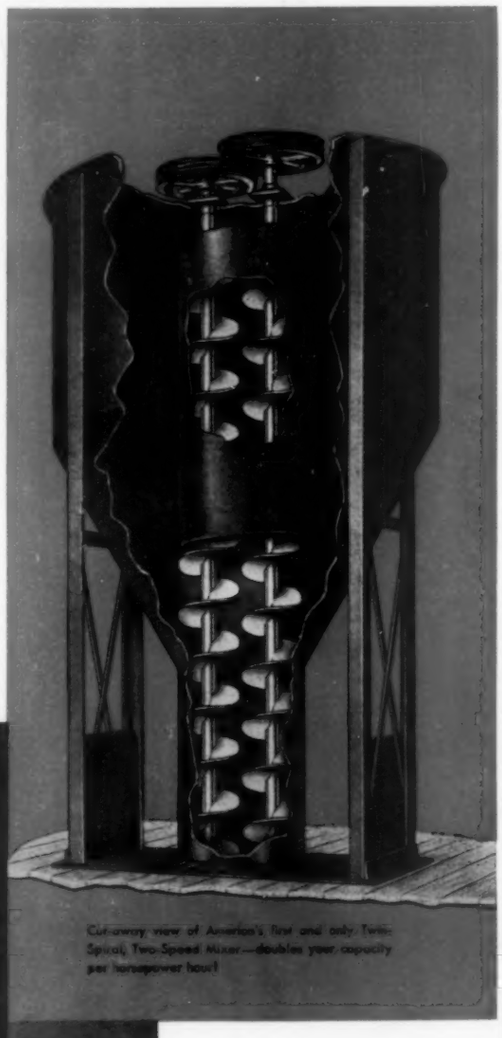

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TABLE 2.* Dry Lot Feeding of Lambs
University of Minnesota, 1960

Lot No.	Treatments	Average gain, lb.	Daily feed, lb.	Feed/ 100 lb. gain	Feed cost/100
1	Corn-long hay	.46	3.59	788	$11.34
2	Oat pellet	.42	3.61	869	16.28
3	Barley pellet	.42	4.63	1104	22.34
4	Cob pellet, 60%	.37	4.10	1099	11.98
5	Cob pellet, 40%	.53	4.91	919	11.76
6	Hay-corn pellet	.60	4.81	796	13.06
7	Pellet to ground grain	.49	3.84	779	12.49
8	Salt-grain	.48	3.79	793	12.20
9	Rep. of 7	.53	3.60	738	11.76
10	Rep. of 8	.46	3.70	799	12.22

*Initial average weight about 70 lb. Twelve lambs fed per lot.

no additional hay being fed resulted in the slowest gain of any in the trial. However, a pelleted ration containing 40% cob and 20% hay resulted in the second fastest gaining lambs of any of the rations fed. Due to the very low cost of the cob, either cob ration (Lots 4 and 5) resulted in a lower feed cost than when a complete pelleted ration containing 65% alfalfa was fed (Lot 6).

Switching lambs from a complete pelleted ration to a ground corn ration with long hay slowed the gains down considerably for a 2 or 3 week period. Thereafter they became adjusted to the ground grain and gained, during the entire 71-day period, about ½ lb. a day (Lots 7 and 9). Since the relatively high cost pellet was fed for a short period of time the feed cost per hundred was less with this method of feeding than when the pellet was fed during the entire 71-day period.

Salt System

The system of using salt as a means of restricting the amount of grain consumption resulted in rather slow gains during the period when the level of salt was rather high (15% salt). As the amount of salt was reduced and finally eliminated at the end of 28 days, the rate of gain increased and, during the 71-day feeding period, lambs gained about .47 lb. per lamb daily (Lots 8 and 9). It was interesting to note that they ate about .15 lb. salt a day, or about 10 times more than they normally would.

COBALT BULLETS — The entire trace mineral picture remains hazy. The development of the cobalt bullet aids in obtaining data on cobalt needs of ruminants since the treatment can be superimposed upon other nutritional studies. Accordingly, half the lambs in each lot that were fed in the cornfield trial and half the lambs in each lot that were fed in the dry lot experiment received a cobalt bullet at the initiation of each trial. In both of these experiments no salt that contained cobalt was fed. A total of 15 separate lots involving 177 lambs were used in this study.

In nine out of 15 lots, lambs treated with cobalt bullets gained slightly faster (.01 to .19 lb. per lamb daily) than the control lambs. When the data for all 15 lots was pooled, the lambs treated with cobalt gained .035 lb. per lamb daily faster than the control lambs. While a trend appeared in favor of cobalt, these differences are not statistically significant.

In six north central counties in Minnesota a cobalt study was conducted with suckling lambs that were grazing on pasture during the summer months. R. E. Jacobs, University of Minnesota animal husbandry extension staff, reported there was considerable variation in response to cobalt between farms but in general these differences were slight and when the data was pooled the control and the treated lambs gained exactly the same.

FARM FLOCK — The practice of early weaning has become very popular among sheepmen. Research indicates that: (1) Lambs should be weaned at 10-12 weeks rather than at 6-8 weeks; (2) creep feeding is an absolute essential and the creep feed should be palatable so that feed consumption amounts to about ¾ lb. by the time the lambs are weaned; (3) if the sheepman desires to sell choice 90-95 lb. lambs at ages of 6 months or less, it is essential to continue grain feeding regardless of how good the pasture may be, and (4) if early weaning is to be feasible and economically successful, it is essential to reduce the feed cost of the non-lactating ewe.

Results of the tests run at the Minnesota station indicate that one may eliminate the grain feeding of ewes about 4 weeks after lambing without affecting lamb gains appreciably. It did, however, reduce the production costs considerably. Too, creep feeding the lambs resulted in far more lamb production than a comparable amount of grain fed to the ewe.

Another means of reducing production costs was the method of restricting the amount of time that the ewes were allowed to graze to about one half of normal. This extended the grazing season and increased the carrying capacity.

Cuba's 1961 Molasses Export Figures Told

NEW ORLEANS — Trade reports indicate that Cuba has sold about 125 million gallons of 1961 crop blackstrap molasses for export, according to the U.S. Department of Agriculture office here.

Of this amount, the same sources indicate approximately 5 million gallons were sold for export to the United Kingdom at a price of 10¢ per gallon based on 52 sugars. Approximately 120 million gallons were reported sold for export to the U.S. Of this amount, trade sources indicated that 90 million gallons were designated for use in the manufacture of alcohol and priced at 9¢ per gallon basis 52 sugars while 32 million gallons were said to be sold for feed use at a price of 10¢ per gallon, same sugar basis.

The molasses sold for feed use would all require payment for additional sugars up to a maximum of 57. The above sales contracts were said to carry a clause that if future sales were made at lower prices during the year, a downward adjustment in the price of these sales would be made. Delivery period is for the calendar year 1961.

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Iowa Hog Conference Planned for March 7

AMES, IOWA—Reports on new research producer experience with "SPF" swine and educational developments in work with swine at Iowa State University will be presented here March 7 at the annual Iowa Swine Production Conference.

Dr. H. L. Self, in charge of program plans, said William Zmolek, extension animal husbandman, will report on a "related group" educational program being developed by the extension service. This program is available to industries and individuals in businesses that are related to hog production.

Sessions in this new off-campus educational "class work" have been held throughout the state during the past six months, involving feed dealers, implement dealers, livestock buyers, vocational agriculture teachers, bank groups and others. Dr. Self said some results have appeared already that may help speed the spread of new swine and pork production information and consolidate swine and swine-related interests for efficient cooperation.

Willard Dielschneider, swine producer at Conrad, will report on "What I Have Learned About Specific Pathogen-Free Swine." Mr. Dielschneider was one of the first to go into the SPF swine program in Iowa. He now has natural-farrowed pigs from his SPF sows. These pigs are 2-3 months old.

Dr. Vaugh Speer of the university swine nutrition research staff will report on future research developments at the university's swine nutrition research experimental farm.

Dr. Virgil Hays of the swine nutrition research staff will point out possible sources of confusion in handling the research-developed program for adjusting to a "least-feed-cost," or "least time" ration. This is a variable ration program to provide greatest possible money return from hogs on feed.

It is based on a slide-rule formula that balances a ration to provide the most profitable rate of gain under any current market outlook. Dr. Self said many Iowa hog producers are using this formula, but some have been confused about some of the terms used in the program. Dr. Hays' talk is to help all swine producers make more efficient use of this program.

Dr. William A. Hagan, director of the National Animal Disease Laboratory, will report on the progress of building at the laboratory site northeast of Ames, using pictures to identify the buildings under construction now.

Dr. L. N. Hazel of Iowa State University will report research findings on relative cost of production of high-quality and low-quality pork.

440% Increase in Earnings Reported by Nebraska Mill Firm

OMAHA — Nebraska Consolidated Mills Co. earnings for 28 weeks ending Jan. 15, 1961, were up 440% over the corresponding period last year, J. A. Mactier, president, reported to shareholders.

The consolidated net income for the period, according to the unaudited report, was $689,590, compared to $155,770 in the similar period last year. Net income per share was $1.23, compared with 28¢ in the same period of the last fiscal year.

Sales amounted to $29,163,047, up 10% over sales of $26,208,306 in the first 28 weeks of the last fiscal year.

"The big change in our business is that we are earning money in our subsidiary, Molinos de Puerto Rico, which was operating at a substantial loss a year ago," Mr. Mactier said. Molinos completed Puerto Rico's first flour, corn meal and animal feed mill in 1959. Molinos has a 10-year exemption from Puerto Rican corporate income taxes, an eight-year exemption from other commonwealth and municipal levies and is not subject to U.S. corporate income taxes.

"In our business in the continental U.S., profits are moderately up in each of the three major categories: Bakery flour, animal feeds and grocery products," Mr. Mactier said. He predicted that sales and profits for the company would maintain the present pace throughout the fiscal year.

Nebraska Consolidated mills in Grand Island, Fremont and Omaha, and in Greensburg, Ind., produce Wisdom Brand flour for sale to commercial bakeries. Alabama Flour Mills, a division with mills in Decatur, Ala., and Tunnel Hill, Ga., processes products sold to consumers, such as Red Hat animal feeds and Mother's Best flour and corn meal, as well as bulk flour for commercial bakeries.

Larro Feeds Names District Sales Head

SAN FRANCISCO — The General Mills-Sperry Operations office here has announced that Jack W. Gaisser recently returned to Ogden, Utah, in the capacity of district sales manager for Larro Feeds. He formerly held this post, but left in 1955 to take an administrative assignment here and was later sales manager in northern California. Mr. Gaisser, who has more than 27 years of service with General Mills, will direct all feed sales and service, except turkey operations, in Nevada and Utah and in areas of Arizona, Idaho, Wyoming and Colorado.

J. W. Gaisser

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Many Aspects of Animal Nutrition Discussed at Illinois Conference

URBANA, ILL.—Reviews of related experimental data and reports of new test results covering many aspects of animal nutrition were presented at the Feb. 1-2 Illinois Nutrition Conference here by scientists representing the University of Illinois and other institutions.

These discussions included reports on: Effect of grain preparation upon utilization by swine; new concepts regarding amino acid nutrition of the chicks; influence of environment on the protein requirements of laying hens; factors affecting zinc availability; special considerations of "SPF" pigs; effects of calcium and phosphorus in dairy rations; nutritional considerations of milk replacers; relation of hormones to nutrition and relation of nutrition to the genesis of cancer.

Summaries

Summaries of these papers follow:

EFFECT OF PREPARATION OF GRAIN UPON ITS UTILIZATION BY SWINE—Evidence that grinding corn may have some influence on its feeding value in modern swine rations was discussed by Dr. D. E. Becker, University of Illinois swine scientist. He said this evidence has been collected at the University of Illinois and reported by Carlisle et al.

The Illinois scientists found that a complete (ground corn) ration for growing-finishing pigs fed in drylot supported a greater rate of gain than a ration of shelled corn mixed with supplementary ingredients. However, efficiency of gain was found to be no different.

Dr. Becker said a series of studies have been conducted to determine the effect of fineness of grinding corn on the performance of growing-finishing pigs.

The ground corn study results are greatly significant because they are new and in some respects different from those found in previous studies. Dr. Becker noted that most of the experimental work on the effect of grinding on the value of corn for swine was conducted about three decades ago.

"Morrison has reviewed the feeding trials and has concluded that, for pigs fed to the usual market weight, there is no saving whatsoever from grinding shelled corn," Dr. Becker said. "Even with hand-feeding, he reported little or no saving from grinding corn for pigs until they reached a weight of about 150 lb. From then up to usual market weights, the saving was usually not more than 6-7%."

Balance trials have shown that grinding shelled corn increases its nutritive value. For instance, in 1935 Garrigus and Mitchell studied the relative digestibility and metabolizable energy value of whole and ground corn with pigs weighing from 135 to 196 lb. Dr. Becker said they observed that grinding corn to a medium degree of fineness increased the digestibility of the protein by 13% and the digestibility of the gross energy by 2.8%. Grinding increased the metabolizable energy value by 3.5%. "These findings agreed with earlier studies of a similar nature," Dr. Becker noted.

"Since the experimental studies of the effect of grinding on the value of corn as a swine feed, several changes have occurred that may have an important bearing on this problem. For example, the type of supplementary protein has switched largely from animal protein to plant protein, such as soybean meal. Also, present swine rations are formulated to contain less crude protein; the recommended protein level for the weanling pig has decreased from 22 to 16% of the ration. Corn, therefore, comprises a greater per cent of the total ration or of the dietary energy and protein at the lower protein level.

"It is important to note that rate and efficiency of gain and feed intake of growing-finishing swine have increased markedly in the past 30 years. Any one of these changes could have an important bearing on the benefits of grinding."

NEW CONCEPTS REGARDING THE AMINO ACID NUTRITION OF THE CHICK—The conference presentation of Dr. H. M. Scott, University of Illinois poultry scientist, was concerned with studies of the pattern of amino acids in excess of nutritional requirements.

"Amino acids in excess of the requirement are wasted in so far as protein synthesis (true growth) is concerned unless they are balanced out with other amino acids," Dr. Scott reported. "Furthermore, these excess amino acids may, under certain conditions, place a stress on the bird and, finally, they may increase the requirement for certain other amino acids."

Dr. Scott noted that this new concept has evolved as a result of studies to examine the amino acid adequacy of intact casein and a crystalline amino acid mixture simulating the amino acid pattern of casein.

"If the recommendations of the National Research Council are accepted as a standard for the amino acid requirement of the chick, calculations show that the sum of the excess amino acids in a diet containing 20% protein from casein equals + 4.48%," Dr. Scott said. "Three amino acids — arginine, cystine + methionine and glycine—do not meet the standard.

"It has long been known that chicks fed a casein diet (20% protein) would respond to supplemental arginine up to a level of 1.6 to 1.7% total arginine, well in excess of NRC's requirement of 1.2%. Various investigators have studied this problem and several theories have been advanced to explain the phenomenon, but none has stood the test of research.

"In examining the extent to which the amino acids are in excess, it is noted that histidine is present in amounts to provide a diet with 40% protein, i.e., 100% in excess, lysine 64%, isoleucine 120%, etc.

"Since a purified diet containing 20% protein from casein is deficient in protein, it is not surprising, therefore, that the addition of arginine to the diet above 1.2% would enhance chick growth when sulfur amino acids and glycine are not limiting.

"Tissue synthesis can proceed when arginine is added to supplement the amino acids that are in excess. This appears to be the most logical explanation offered to date as to why

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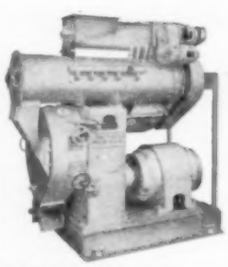

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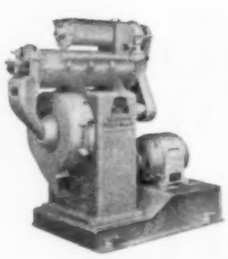

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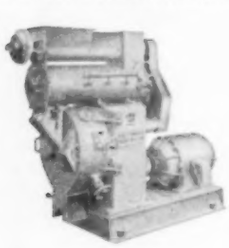

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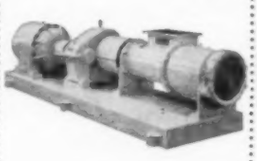

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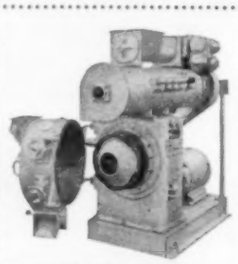

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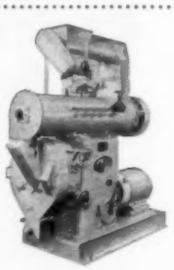

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chicks respond to this high level of arginine and is in keeping with the principle that the most limiting amino acid will determine the extent to which dietary nitrogen can be used for tissue synthesis. Arginine is indeed the most limiting amino acid in the excess amino acids."

INFLUENCE OF ENVIRONMENT ON THE PROTEIN REQUIREMENTS OF LAYING HENS—Dr. D. J. Bray, University of Illinois poultry scientist, reported the following observations and conclusions indicated by an experiment conducted to measure the effect of environmental temperature (76° F. and 86° F.) on the protein requirement for egg production while other factors which might influence the observations were brought under control:

1. Temperature per se did not affect rate of lay, but it did affect egg production (numbers x weight) because of an adverse effect of the 86° F. temperature upon egg weight.

2. Rate of lay of pullets fed a given suboptimal protein diet decreased sooner and to a greater extent in the 86° F. chamber than in the 76° F. chamber, but the rate of decline was comparable at a given suboptimal protein intake.

3. Single slope regression analysis showed that egg production (grams per bird per day) maximized at the 12.8% protein level in the 76° F. chamber and at the 14.9% level in the 86° F. Chamber. Protein intakes of 14.3 gm. and 13.4 gm. per bird per day were required in the 76° F. and 86° F. chambers, respectively.

FACTORS AFFECTING ZINC AVAILABILITY IN ANIMAL RATIONS—Dr. R. M. Forbes, University of Illinois animal nutritionist, reviewed the results of investigations undertaken to study factors affecting availability of zinc to animals.

He reported evidence indicates that the symptoms of zinc deficiency may be exaggerated by raising the calcium intake, but balance studies and carefully designed growth studies have not shown the zinc requirement or availability to be measurably altered by increase of dietary calcium.

Dr. Forbes also noted that Roberson and Schaible in 1958 demonstrated that zinc as the chloride or as sulfate is equally available to chicks. In 1959, Edwards showed the essentially equal availability to chicks of zinc fed as the oxide, sulfate, carbonate and free metal.

It has become apparent—in investigations aimed at designing more highly purified diets—that variation in protein sources has a great influence on zinc requirement, Dr. Forbes explained. This influence is, in some way, unrelated to protein quality.

Ways of improving growth on low zinc diets containing soy protein have been investigated, and two have been found: Autoclaving of the protein and use of EDTA, a chelating agent.

NUTRITIONAL CONSIDERATIONS OF "SPECIFIC PATHOGEN-FREE" PIGS—Specific nutritive requirements of SPF swine have yet to be elucidated, according to Dr. A. H. Jensen, department of animal science at Illinois, but it is known that special care in both diet formulation and management procedures is essential for the colostrum-deprived SPF pig, particularly until the animals are three or four weeks of age.

"For subsequent development and normally produced offspring, dietary regimens satisfactory for non-SPF swine should give excellent results with SPF swine," Dr. Jensen noted. "The basic ingredient for success in maintaining an SPF herd, however, is management."

CALCIUM METABOLISM IN AGED ANIMALS—Dr. Joseph Kastelic, University of Illinois animal science department, said it has been observed that animals, including man, have the ability to adapt to varying intakes of calcium in a way that permits over-all calcium balance to be maintained. "Thus, animals habituated to low calcium intakes are able to maintain calcium balance as well as animals habituated to much higher intakes of calcium," he said. "Animals subjected to a low-calcium regimen when placed on a low-calcium diet will go into negative calcium balance, but animals previously adapted to low-calcium intakes may maintain balance. Failure to take this phenomenon into account has resulted in many inconsistent reports about conclusions concerning the calcium needs of animals.

Dr. Kastelic reported that it had been observed in University of Illinois tests on calcium metabolism in aging rats that even though calcium retention was poorer in skeletons of old animals than in younger adult animals, both groups of animals were able to maintain over-all calcium balance.

"The surprising finding," he said, "was that aged rats appeared to have the ability to compensate for increasing fecal excretion of absorbed calcium by being able to absorb significantly more dietary calcium than the younger rats."

It has been shown that "the integrity of the chemical and physiological structures of the skeleton appears to be dependent upon maintenance of the efficiency of the mechanisms responsible for incorporating minerals into the skeleton that offset those liberated and lost to endogenous excretion."

Dr. Kastelic added: "The mere fact that one might be successful in increasing the amounts of calcium absorbed by the aging animal would be without avail unless an improvement in retention in the skeleton could also be brought about at the same time."

EFFECTS OF CALCIUM AND PHOSPHORUS SUPPLEMENTS IN DAIRY RATIONS—Dr. K. A. Kendall, Illinois dairy scientist, reviewed experimental data indicating various effects of calcium and phosphorus supplements in dairy rations.

He reported that some studies show that a large excess of dietary calcium over phosphorus affects the digestibility or utilization of feed nutrients.

Other work shows the effects of adding limestone or dicalcium phosphate upon the nutritive value of feeds feed to dairy heifers. Results of these studies indicated that adding limestone lowered the digestibility of both protein and energy, Dr. Kendall said.

"The effects of calcium to phosphorus ratios on the incidence of milk fever in Jersey cows have been reported by Boda and Cole. A calcium-phosphorus ratio of 6:1 in the ration

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Research Report

LEG WEAKNESS IN TURKEYS AND CHICKENS

BULLETIN

A condition resembling rickets has been observed in chickens and turkeys with increasing frequency during the past year. The syndrome is characterized by soft bones and a soft rubbery beak. Levels of Vitamin D as high as 4,000 I.C. Units Per Pound have not had any effect in preventing or curing the trouble. The difficulty has been observed and diagnosed in widely separated areas. Apparently this is a new condition which has not been heretofore reported.

Recovery is often spontaneous, and may occur irrespective of attempted therapeutic measures. Vitamin D-3 has been reported to correct the difficulty when administered in the water - if such a procedure is carried out with a control pen where no additional D-3 is given, recovery may likewise occur in the control pen thus illustrating the fact that D-3 is not effective in over-coming or preventing the supposed rickets.

It is possible that genetically improved strains of turkeys and broilers may have a requirement, not previously recognized, for some nutrient, possibly unidentified. Such nutrient might be either organic or inorganic in nature.

Nutritionists in leading Universities and Agricultural Experiment Stations are diligently studying the problem. It is hoped that an answer may be arrived at very soon since the difficulty has caused heavy losses where broilers and/or turkeys are being produced on an intensive scale.

It has been reported in some instances that the condition has occurred in one house on a farm, whereas birds in a comparable house, put down on the day, from the same hatchery, and fed from the same bulk feed truck did not experience the trouble. Thus the occurrence of the syndrome is indeed quite baffling. In other instances all houses on a particular farm may come down with the trouble at the same time.

Our Research Department is in constant contact with personnel and stations carrying out research on this problem. Customers will be advised of new developments or break-throughs at the very earliest possible time.

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where cows were fed alfalfa hay showed 36% of the cows developing milk fever," Dr. Kendall said. "When the calcium to phosphorus ratio was changed to 1:3.3 by adding monosodium phosphate to the ration, none of the cows thus fed contracted milk fever. When the calcium to phosphorus ratio was 1:1, the symptoms appeared in 15% of the cows.

"These results point up the need for further study to determine some of the physiological effects of these minerals as well as the degree to which they are utilized in various ratios."

Illinois studies with dairy steers indicate thaat widening the calcium to phosphorus ratio by adding calcium carbonate to a ration of alfalfa hay or narrowing it by adding dicalcium phosphate or monosodium phosphate as the phosphorus source not only varied the levels of minerals retained, but also caused marked changes in serum calcium and phosphorus.

NUTRITIONAL CONSIDERATIONS OF MILK REPLACERS—Prof. K. E. Harshbarger, University of Illinois dairy science department, noted the following "basic nutritional factors" which he said "must be considered in formulating milk replacers":

1. Provide adequate energy to promote normal growth. Milk sugar and glucose are readily utilized by the calf and can serve as a source of energy. The kind and amount of fat included in the milk replacer is important in supplying adequate energy. Calves have been successfully raised on diets containing less than 1% fat on a dry basis. However, the replacer can be packed with more energy per pound of dry matter by increasing the fat content. Some unsaturated vegetable oils are not efficiently utilized by the dairy calf. Dry replacers are available today which contain from 3.5 to 15% fat.

2. Provide adequate high-quality protein. On the basis of present nutritional information, it is necessary to use milk proteins as the most important source of protein. Vegetable proteins alone have not given satisfactory growth response in the very young calf.

3. Provide vitamins A and D in adequate quantities. In whole milk the vitamin A value is carried in the butterfat. It is not contained in appreciable amounts in the milk products used in milk replacers; thus adequate supplementation is necessary. Vitamin D is a desirable addition in milk replacers to assure adequate intake for the prevention of rickets.

4. Provide an antibiotic in the milk replacer formula. The addition of antibiotics is desirable, since they usually promote a favorable growth response and aid in controlling scours in young dairy calves raised under practical conditions. Also, in milk replacers the antibiotic is fed with no extra effort for mixing.

RELATION OF HORMONES TO NUTRITION—Dr. A. V. Nalbandov, University of Illinois physiologist, reported that recent work has shown that it is possible to study the role of hormones by injecting them into animals completely deprived of food. Furthermore, he said, it has been found that such function as egg-laying and pregnancy can be caused to be performed in hormone-injected, food-deprived animals which, were they not injected with hormones, would normally cease these functions completely and immediately.

"In the absence of food," Dr. Nalbandov explained, "the building blocks normally required for the formation of fetuses, yolk, egg white and egg shell must be mobilized from the body reserves. This technique provides a valuable tool for the study of mechanisms of hormone action, as well as making it possible to study the processes of tearing down of body reserves under hormone stimulation and the pathways taken by the nutrients from the body depots to the formed structures."

NUTRITION IN RELATION TO THE GENESIS OF CANCER—"Although it is known that nutrition modifies the likelihood of developing cancer, the relationships cannot be described in exact biological and biochemical terms," said Dr. Albert Tannenbaum, director, department of cancer research, Michael Reese hospital, Chicago. "Further work on the modes of action may clarify not only the role of nutrition, but the mechanisms involved in carcinogenesis itself."

The formation of neoplasms is influenced, in varying degrees, by the dietary and the nutritional state of the host, Dr. Tannenbaum said. The effects may be divided into two categories:

"1. Situations where tumor re-

(Turn to page 106)

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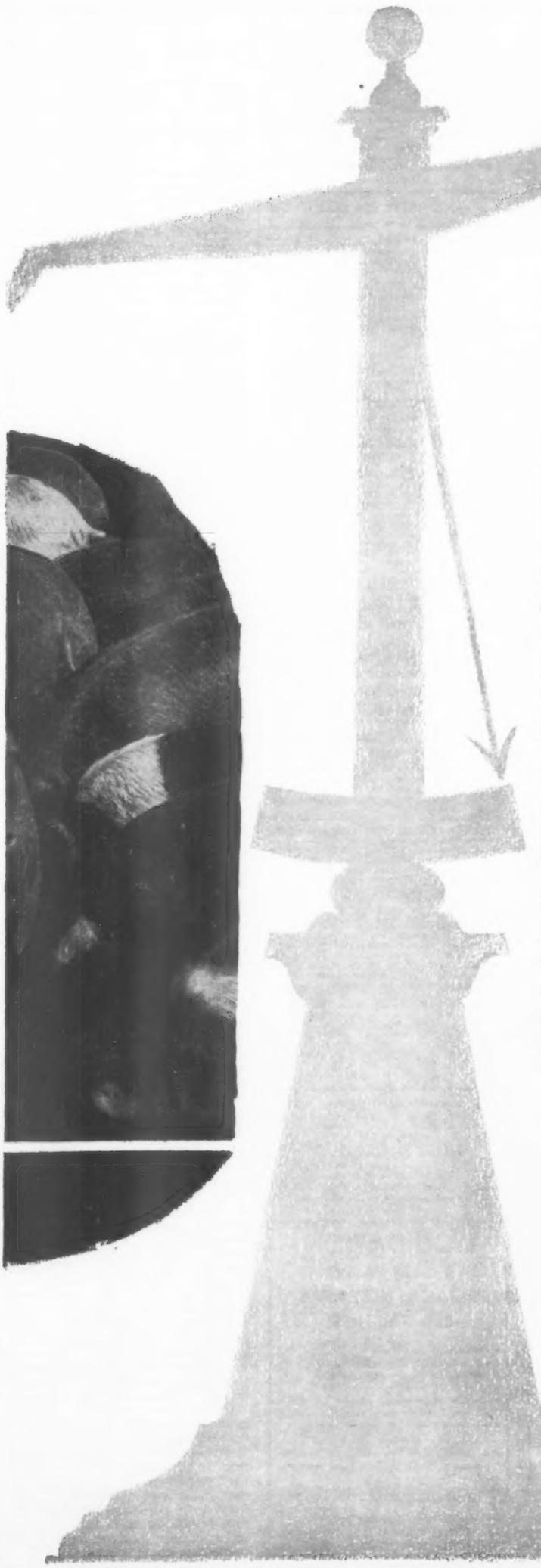

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HUMPHREY MANLIFT 40', 4 FORESTER size 00 finishers, one size 0, Forester scourer size 0, Hart-Carter dia. separator size 1824 FD, two invincible packers, two No. 5 Eureka snappy shakers, two TAG testers, No. 1200 corn sheller. McLaughlin, Ward & Co., Jackson, Mich.

FOR SALE—MODEL 100 SECO MOLASSES mixer. Wenger Mixer Manufacturing, Sabetha, Kansas.

FOR SALE—FAIRBANKS SCALE — 2,000 lb. hopper-suspension pipe lower type. Wolf scale—600 lb. hopper-ceiling or floor supported type. Hart uni-flow grain separator. Forster cyclone wheat cleaner, size 15. S. Howes automatic small sack packer 5 to 50 lb., friction clutch. Buffalo ring oiling fan or blower, 10" intake. Cast and steel split pulleys. Cyclone dust collector, long cone type, 6x12" intake. Cyclone dust collector, long cone type 6x18" intake. Richardson automatic one bushel grain scale. Omega enrichment for bleaching feeder, without scale. 75 H.P., 900 R.P.M., open type motor with sheave and pulley clutch drive. Hayden Flour Mills, Inc., Tecumseh, Mich.

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sponse is dictated by known inducing agents or by intrinsic factors, but is modified, often arrestingly, by nutritional alterations in calorie intake and proportions of dietary fat, protein or vitamins. . . . Chronic restriction of calories strikingly inhibits the development of tumors; proportions of dietary fat, protein and vitamins that are considered to be below the minimum for good nutrition also tend to repress tumor formation. One exception to this generality is the protection afforded by riboflavin against the induction of p-dimethylaminoazobenzene-induced liver tumors.

"2. Situations where no tumor response is normally expected and where no known carcinogens are believed to be acting, yet tumors appear to be induced by a chronic deficiency state. Examples of these instances in animals are hepatic neoplasms produced by choline deficiency and thyroid tumors produced by iodine deficiency. It is recognized that an additional factor may be involved; that is the carcinogenic potentialities of known and unknown substances in food and beverages, and in the atmosphere, acting on tissue made more vulernable through malnutrition."

Canada to Continue Present Hog Supports

OTTAWA — The Canadian government intends to extend present hog support prices another year since prices are higher and troublesome surpluses gone, Alvin Hamilton, agriculture minister, told the House of Commons recently.

But, he warned, "There is very real danger that present prices may encourage a level of production which could lead to heavy supplies and much lower prices later this year."

Support price to producers has been established at $22.65 cwt., national basis, which is about 83.5% of the base of 10-year average price of $27.11 cwt.

Over the past year, prices to producers have averaged about $1 cwt. more than the national support price. A year ago, the price of grade A hogs at Toronto was $23.65. It is now $29 and it has been at or above that level for some time.

Mr. Hamilton said it was important that the government refrain from any action that could be interpreted as an incentive to greater production.

He was referring to signs that hog producers are planning substantial increases in the spring crop—an estimated 16% over the 1960 period—as prices remain well above the support price level.

Over-production would result by fall in the same situation which led to a shift in support price policy early last year, it was reported.

Mr. Hamilton's statement indicated that farmers themselves should gauge production to avoid a sharp break in market price. A Dominion Bureau of Statistics estimate has said that hog production dropped by 14% in 1960 to 5,526,000 animals.

It is understood that the government is watching the situation to see whether a combination of deficiency payments and the old practice of outright purchase might discourage sharp fluctuations in the hog population, halting market price disruption harmful to large and small producers.

Under the deficiency payment method of support, the Agricultural Stabilization Board will determine at the end of 1961 the national average price to producers at which grade A hogs were sold. If this price is less than the support price of $22.65 cwt., a deficiency payment equal to the difference will be made to each registered producer on a maximum of 100 grade A or grade B hogs.

Condemnation Rate For December Told

WASHINGTON—The rate of post-mortem condemnations of young chickens or broilers for the month of December was 2.38%, according to an announcement from the U.S. Department of Agriculture.

Total number of pounds of poultry condemned under the Poultry Production Inspection Act was 12,908,000 (N.Y.D. weight).

Post-mortem condemnations amounted to 11,231,000 lb. Condemnation figures by classes are: Young chickens, 2.38%; mature chickens, 2.53%; young turkeys, 1.12%; old turkeys, 1.33%; fryer-roaster turkeys, 1.91%, and ducks, 2.28%.

Ante-mortem condemnations totaled 1,677,000 lb. (live weight) for all classes. Rate of condemnation by classes follows: Young chickens, 0.27%; mature chickens, 0.33%; young turkeys, 0.29%; old turkeys, 0.11%; fryer-roaster turkeys, 0.37%, and ducks, 0.05%.

The number of head of chickens, turkeys and ducks inspected under the act totaled 131,520,000 head during December compared with 111,587,000 in December of 1959.

NBC Official Delegate To Agricultural Fair

KANSAS CITY — Appointment of Frank Frazier, Richmond, Va., executive vice president, National Broiler Council, to represent the U.S. poultry industry at the World Agricultural Fair next month in Cairo, Egypt, has been announced.

The naming of Mr. Frazier came at the export-import meeting of the 1961 Fact Finding Conference here. Making the announcement were J. O. Parker, chairman of the industry's International Trade Development committee, and Harold M. Williams, president of the Institute of American Poultry Industries which administers the ITD market programs abroad.

Participating in the International Trade Development committee programs, administered by IAPI, are: National Broiler Council, American Poultry & Hatchery Federation, Arkansas Poultry Federation, Delmarva Poultry Industry, Inc., National Turkey Federation, Poultry & Egg National Board, Southeastern Poultry & Egg Assn., Virginia Poultry Federation and a number of private firms.

New Professional Feeds Structure Occupied

KANSAS CITY — The new office building of Professional Feeds division of Spencer Kellogg & Sons, Inc., in Kansas City, was occupied recently.

Designed for an office force of 80 persons, the modern building has advanced facilities for improving service to the more than 1,500 Professional feed dealers located throughout the Midwest, officials said.

A bi-level structure, it incorporates an attractive reception area with executive offices and general office space on the first floor, conference rooms and additional office space on the second level.

The exterior of the contemporary building is buff-colored brick and porcelain panels with extensive window areas. A large patio-type court is a feature of the main entrance.

Spencer Kellogg's Professional Feeds division is the successor to the Staley Milling Co.

Seven mills are now operated by the Professional Feeds division. Two modern mills are in Kansas City, one producing Professional Feeds and the other processing corn products for human consumption. Other feed mills are located in East St. Louis, Ill.; Oxford and Tribune, Kansas; Hanibal, Mo., and Evansville, Ind.

Bemis Expert on Trip

ST. LOUIS — A burlap specialist from Bemis Bro. Bag Co., W. D. McLean, Boston, is currently on a fact-finding trip to India to gain first-hand information on the current shortage of raw jute, the plant from which burlap is manufactured.

Mr. McLean, who heads Bemis' Boston burlap department, will represent two interests during his investigation. In addition to representing Bemis, reportedly the world's largest importer of burlap, he will gain information for the Textile Bag Manufacturers Assn.'s Burlap Business Relations Committee, which he heads.

He plans to spend two weeks in India and East Pakistan and following a visit to the Dundee burlap mills in Scotland will return home March 5.

NEW HOME OFFICE—Here's the new home office of Professional Feeds division of Spencer Kellogg & Sons, Inc., in Kansas City. It incorporates reception area with executive offices and general office space on the first floor, conference rooms and additional office space on the second level.

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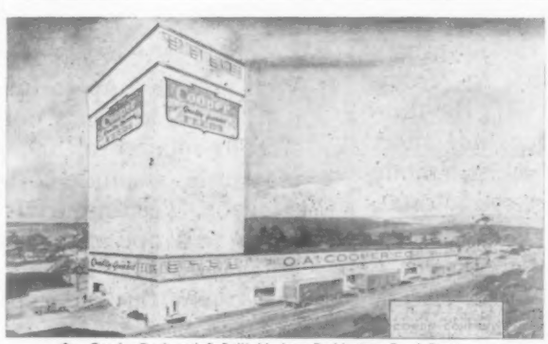

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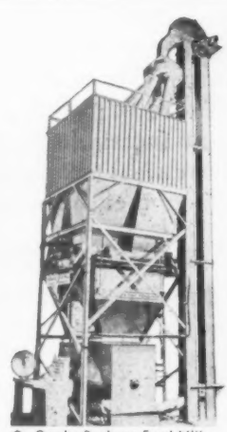

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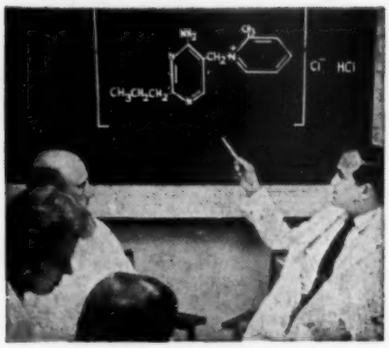

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NOW...FROM THE LEADER IN COCCIDIOSIS RESEARCH

AMPROL...the latest addition to the Merck family of coccidiostats...combines a highly desirable balance of efficacy and safety. Having undergone intensive study and testing under the most advanced methods, it promises to be a truly effective coccidiostat for use in broiler feeds. It is the first coccidiostat evaluated against 44 strains of seven species of coccidia.

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The chemical structure of AMPROL differs completely from that of any other coccidiostat in the industry's history – it is similar to that of thiamine. At recommended use levels it appears to interfere with the thiamine metabolism of the coccidia, but does *not* affect the normal thiamine metabolism of the chicken, a mode of action entirely different from any other coccidiostat.

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The value of AMPROL can be measured by its efficacy and its favorable margin of safety...plus the fact that it permits attractive weight gains and feed conversions. Tests to date have not shown any significant ability of coccidia to develop resistance to AMPROL – indicating a most promising role for years to come – in the management of coccidiosis.

EFFICACY

Exhibits important activity against major coccidia – especially *Eimeria tenella* and *E. necatrix,* under a variety of conditions. In laboratory comparisons with mixed infections of cecal and intestinal coccidiosis, AMPROL gave more protection than other coccidiostats.

PRODUCTION PERFORMANCE

Excellent growth and feed efficiency. After a year of experiments against control flocks, under practical commercial-type conditions, broilers on AMPROL showed higher final weights with favorable feed conversions.

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Tested birds were exposed to four consecutive generations of ten virulent strains of *E. tenella* which did not develop significant resistance to AMPROL.

SAFETY

Well tolerated up to four times suggested use-level of 0.0125%. Side effects noted above 0.05% level are specifically related to thiamine-depletion and are quickly reversible, a simple corrective procedure unique with AMPROL. Feeding trials indicate recommended use-levels will not affect egg quality, egg production or hatchability. No toxicity observed when feeds containing AMPROL are fed to other animals.

USE-LEVELS

Recommended use-level for most field conditions is 0.0125%. Where adverse conditions and less sensitive strains of coccidia prevail, use the 0.025% level.

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ILLINOIS

(Continued from page 7)

two pounds of molasses daily wintered well and calved normally. Dr. Pfander pointed out that previous South African trials show that molasses reduces the toxic effects of nitrate.

(3) Cows fed corn silage and alfalfa hay containing, respectively, 2 and 0.1-0.7% potassium nitrate, reduced their milk production. No live protozoa were observed in the rumens of several cows. Milk production returned to normal when nitrate intake was reduced and molasses was added to the ration.

(4) Two dairy cows in mid-lactation were fed either 1.25 or 0.75% potassium nitrate. Both cows decreased milk production; the cow on the highest level died, and the other cow aborted. Few investigators, however, have been able to confirm this observation. And a review of the experimental procedures showed that the major difference between this trial and others was the fact that the nitrate was mixed in the feed twice daily, Dr. Pfander said.

The effects of nitrate treatments upon the vitamin A nutrition of the animals studied were variable. Sometimes the treatments caused elevated vitamin A levels in the plasma, but the levels were subsequently reduced below normal.

Lamb Study

J. H. Sokolowski's manuscript reported a study with lambs. The study compared vitamin A and carotene at the recommended National Research Council levels, with and without potassium nitrate.

After 83 days, lambs that had received carotene or vitamin A, but no nitrate, had made the fastest gains. Lambs that received nitrate, plus vitamin A or carotene did not gain as well on the average. Lambs receiving nitrate but no vitamin A or carotene made the poorest gains.

Gains varied between lambs receiving nitrate and either vitamin A or carotene. This indicates a possible relationship between nitrate, vitamin A and carotene. But Mr. Sokolowski says these results are preliminary and much further testing is needed before any concrete statements are made.

Mr. Sokolowski's report also mentioned another study involving vitamin A. Lambs in the control group received 4.8 percent potassium nitrate, plus 1,100 I.U. of vitamin A per pound of feed. A second group received the same amount of potassium nitrate, plus 22,000 I.U. of vitamin A.

Although gains of lambs in the second group were lower than usual, they were substantially higher than gains that the control lambs made.

Conflicting Reports

An overall look at the panel discussion revealed some conflicting reports, of which the panel members were well aware. As they said, "You can feed the same ration to a group of animals and some of them will develop a vitamin A-deficiency, while others will not."

For example, Mr. Sokolowski fed potassium nitrate to lambs in one trial that did not develop any observed ill effects. Yet lambs in another trial fed similar rations supplemented with potassium nitrate did.

Therefore the panel agrees that vitamin A-deficiencies vary among species as well as among individuals of the same species.

In summing up his talk, Dr. George E. Mitchell, University of Kentucky researcher, formerly with the University of Illinois, said that when vitamin A-deficiency occurs, the primary factors affecting its occurrence and severity may be summarized as follows:

(1) The animal's physiological requirement for vitamin A.

(2) The amount and availability of the carotene and vitamin A stored in the body.

(3) The amount of carotene and vitamin A being fed.

(4) The efficiency of utilization of the dietary carotene and vitamin A.

Dr. Mitchell also said, "It is becoming increasingly apparent that our current knowledge of how to relate these factors to changing feedlot conditions is inadequate."

Therefore research is already underway at Illinois and other universities to clarify the relation between silage rations, dietary nitrite, thyroid agents and conversion of carotene and utilization of vitamin A.

After the panel finished its discussions, the members answered questions from the audience. Here are three of the questions tossed at them:

Question: How much true vitamin A should be added to fattening rations for beef cattle, if the cattle are showing symptoms of vitamin A-deficiency?

Answer: 30,000 I.U. per head daily, according to Dr. Pfander.

Q. Should any vitamin A value be given to carotene anymore?

A. "Yes, 95% of the time," said Dr. Mitchell. The other 5% depends on how much insurance a feeder wants to take, by adding preformed vitamin A to the ration. Dr. Mitchell believes that some insurance should be taken.

Q. What does the University of Illinois recommend?

A. 10,000 I.U. of vitamin A per head daily. If silage is fed, 5,000 I.U. should come from preformed vitamin A.

According to studies of the role of vitamin A in metabolism described by Dr. B. Connor Johnson, professor of animal biochemistry at the University of Illinois, "it appears that vitamin A deficiency leads first to a degeneration of certain adrenal cortex cells and second to the observed depression glyconeogenesis brought about by the impairment in glucocorticoid production."

In vitro experiments using adrenal homogenates have indicated there is a block in the conversion of cholesterol to corticosterone in the vitamin A-deficient adrenal, Dr. Johnson explained. And in vivo experiments indicate that the block is in the conversion of deoxycorticosterone to corticosterone. "On the other hand," he noted, "there is also evidence that vitamin A functions in the adrenal in the conversion of pregnenolone to progesterone.

"Recently Wiss and Gloor also found an inhibitory effect of vitamin A deficiency on the biosynthesis of cholesterol from mevalonic acid in the intact animal. We have been able to confirm this finding in vitro. Thus, it would appear that one important function of vitamin A is in the area of steroid and steroid hormone biosynthesis."

Dr. Johnson said an entirely different approach to the problem of vitamin A function has been prompted by the studies of Fell et al., who found that vitamin A was related to the transfer of sulfate groups into chondroitin sulfate in bone cells grown in tissue culture.

"With this as a guide," Dr. Johnson commented, "we have looked at the effect of vitamin A deficiency on the uptake of radiosulfur from sulfate into the mucopolysaccharides of the intestinal mucosa."

Kansas City Feed Club To Hear James Hogan

KANSAS CITY—James W. Hogan, manager of the grain, grain products and merchandising department of the Ralston Purina Co., St. Louis, will address a meeting of the Kansas City Feed Club Feb. 28, at the Hotel Phillips. Mr. Hogan's topic will be "Price Stability of Grain and Commodities in the Feed Industry."

The Feb. 28 meeting will start with cocktails at 6:00 p.m., with dinner at 7:00 and Mr. Hogan's talk. His presentation will be followed by a question-and-answer period.

CCC

(Continued from page 1)

price which enables them to produce poultry products more cheaply than U.S. exporters can deliver similar poultry products abroad, using feeds based on the higher domestic feed grain prices. Thus, the U.S. export program is undercutting the poultry products exporter in his effort to enlarge foreign markets for American poultrymen.

Competition

"We will help our farmers more by giving our export poultry processors the opportunity to compete better with American poultry overseas than to give our grain away to foreign competitors," Mr. Bauer said. "The new administration has started a splendid program called 'Food for Peace' which in effect should, and probably will, include poultry."

Mr. Bauer also suggested that the federal government could assist poultry products exports by the construction of cold storage plants in some foreign markets where there are none or only a few. Lack of such facilities is one barrier to exports to the Middle East and Asia, he said. "Let us hope that our government will decide soon that it is better to export poultry which has been fed American feed than to export American feed overseas," Mr. Bauer commented.

Mr. Bauer stressed the large potential market that exists in the export field and this point also was made by Harold Williams, Chicago, president, Institute of American Poultry Industries. Mr. Williams said that exports of poultry products to western Europe increased from 400,000 lb. in 1956 to 100 million pounds in 1960. These exports were paid for in cash and were not exported in connection with a federally subsidized foreign aid program, he said.

Federal Grand Jury Probing Iowa Firm

SHELDON, IOWA — Subpoenaed directors, some former employees, accountants and some stockholders of Northern Biochemical Co., Sheldon, appeared this week before a federal grand jury at Sioux City. The hearings are a part of the grand jury's investigation of the firm which markets a feed enzyme product.

Northern Biochemical has been mentioned in connection with the embezzlement of more than $2 million from the Sheldon (Iowa) National Bank. Mrs. Burnice Geiger, the bank officer who admitted the embezzlement, is a major stockholder in Northern Biochemical.

Program to Include Farm Credit Outlook

KANSAS CITY—The current outlook for farm credit will be surveyed at the annual Farm Supply Executive Credit Managers Conference at the Hotel President here Feb. 28.

Several speakers will discuss various aspects of the credit problem and its relation to current market conditions. The meeting will begin at 2 p.m.

The question, "What Is the Future of the Feed Dealer?" will be answered in a talk by Raymond Doll, senior economist, Federal Reserve Bank, Kansas City. Ted McGuire, district manager, Production Credit Administration, St. Louis, will discuss the PCA part in farm credit. Rod Turnbull, editor, Weekly Star Farmer, will describe what new agricultural farm legislation may mean for the farmer and feeder. Martin Newell, Feedstuffs, will discuss the trends in thinking on credit and merchandising in the feed manufacturing industry.

Following dinner at 6:30 p.m., Maurice Johnson, vice president, First National Bank, Kansas City, will discuss the topic "Feed Financing Is Growing Up."

E. C. McKinney, Kansas City, regional credit manager, General Mills, Inc., will be chairman of the meeting. Fred Bienhoff, Bartlett & Co., Kansas City, is program chairman.

Packing Plant for Sale

REDMOND, ORE. — Redmond (Ore.) Packing Plant is for sale, according to officials of the Carnation Corp., Los Angeles.

David Gage, who has been manager since July, 1960, says the horse-killing plant, hayfer mill, 13 pens where cattle are fed, and all properties will be sold as a unit. The mill and buildings are within the city limits with cattle feedlots outside. About 30 acres of land are involved.

Mr. Gage says that operations will cease by April 1. The mill has been making compressed feed hayfers for chinchilla trade only, for some time, and will continue to manufacture these through March.

ELEVATOR FIRM SUED

PROSSER, WASH.—Sampson Elevator Co. here is being sued in the Benton County Superior Court for $50,759.78 for injuries that a 64-year-old Prosser visitor is reported to have suffered Sept. 9, 1959, when he was caught and dragged through a grain auger at the company's Whitstran plant.

TOP OF THE HOPPER

(Continued from page 2)

to the Delaney problem, and those close to the effort believe that chances are pretty good for getting some appropriate changes made.

The liaison committee's recent statement presented to FDA sums up the industry's position on the "prior sanction" issue:

"The legal interpretation by the FDA of the 'prior sanction or approval clause' of the Food Additives Amendment continues to create hardship and a grossly discriminatory situation within the feed industry. It is the opinion of our industry that all manufacturers who can meet the qualifications should be entitled to equal treatment regarding the use of any feed additive. Any other interpretation appears to violate 'the rule of reason' concept of jurisprudence and is a distorted view of the intent of the law.

"Members of the feed industry are quite aware of 'grandfather clauses'—in fact they are nothing new and quite common in American business, government and professional life. As an industry we are in favor of the 'grandfather clause' in the Food Additives Amendment and we would be opposed to any effort to nullify or repeal it. All we are asking is a reasonable and logical interpretation of the clause as it applies to the feed industry. Prior sanction or approval as applied to the feed industry should be by product. Such a policy would then be consistent with that applied to additives used by other industries.

"Until this serious inequity is resolved, it will be most difficult to solve many of the other pressing problems. A number of important, effective and commonly-used feed additives and combinations of feed additives are involved under the 'prior approval' interpretation."

The FEED MARKET

PRICE QUOTATIONS, MARKET TRENDS
OF PRINCIPAL INGREDIENTS

NOTE: Quotations on feed ingredients shown in these and adjoining columns are wholesale prices, per ton, bulk, for prompt delivery, unless otherwise noted. They are the latest quotations available from Feedstuffs correspondents and are not necessarily those in effect on date of publication. The prices represent fair average trading values and do not necessarily represent extreme low or high levels at which individual sales might have occurred. A descriptive summary of supply and demand factors prevalent in the feed market appears on page 2.

A AND D FEEDING OIL

Boston: Demand and supply steady; 400 D, 3,000 A 19½¢ lb.; 300 D, 3,000 A 19¢; 300 D, 2,250 A 17½¢; 300 D, 1,500 A 16¢; 300 D, 750 A 14¢; 75 D, 750 A 13½¢.

New York: 1,500 A, 300 D 15¢ lb.; 2,250 A, 300 D 16½¢ lb.

Chicago: Demand fair; trend steady; supply ample; straight A feeding oil, with 10,000 units vitamin A per gram, 7@7¼¢ a million units of vitamin A, l.c.l., packed in 55 gal. drums, f.o.b. Chicago, drums included.

Minneapolis: Demand fair; supply ample; 10,000 A 31¢ lb.; 300 D, 2,250 A 17½¢ lb.; 300 D, 1,500 A 16¢ lb.; 300 D, 750 A 13½¢ lb.

Denver: Demand fair; trend steady; supply ample; 21¢ lb.

ALFALFA MEAL

Cincinnati: No offerings.

Portland: Demand slow; supply adequate; trend unchanged; $46@73, sacked, for the two different types.

Philadelphia: Demand and supply fair; 17% dehydrated $59.50.

Omaha: Demand slow; trend steady; supply ample; 17% dehydrated, 100,000 A units, bulk pellets $44; sacked meal $49, Omaha basis.

Kansas City: Demand fair; trend steady; supply ample; 17% dehydrated alfalfa, 100,000 A on arrival, pellets $45@48, reground pellets $46.50@49; 18% dehydrated alfalfa, 125,000 A on arrival, pellets $47@51, reground pellets $48@52; 20% dehydrated alfalfa, 150,000 A on arrival, pellets $50@53, reground pellets $51@54; suncured alfalfa, demand slow, supply adequate, 13% pellets $35@37, No. 1 ¼-in. $40, sacked.

Boston: Demand fair; supply steady; dehydrated, 17%, pellets $58; suncured, 13%, pellets $46.

Los Angeles: Demand steady; trend easier; supply adequate; dehydrated meal, 17% protein, 100,000 A $52@53, nominal; dehydrated pellet meal, 17% protein, 100,000 A $54@56, nominal; suncured meal, 15% protein $44@45; suncured crumbles, 15% protein $46@47.

Ft. Worth: Demand fair for dehydrated, slow for suncured; supply sufficient; sacked: dehydrated, 17%, 100,000 A $56.10@57.10, truck or rail; suncured: 13% ¼-in. grind No. 1 $47, truck; 15% fine ground, dry $49, with 2% fat added $51, rail or truck.

Chicago: Demand fair; trend easier; supply ample; dehydrated, 17% protein, No. 1 100,000 units vitamin A $48@48.50.

St. Louis: Demand slow; trend easier; supply adequate; suncured, 13% fine, sacked $48; dehydrated, 17%, 100,000 A, pellets, demand slow, trend lower, supply ample, bulk $47.

Memphis: Demand poor to fair; trend steady; supply ample; dehydrated, 17% protein, guaranteed 100,000 units vitamin A $52@52.60; reground pellets $53.60.

Seattle: Demand fair; trend steady; supply good; 15% protein suncured $51, 150,000 A unit dehydrated $72, both delivered truck loads, sacked.

Buffalo: Demand fair to poor; trend steady; supply adequate; $65.60, sacked, Boston.

Minneapolis: Steady market; demand fair; supplies ample; 17% dehydrated, 100,000 units vitamin A reground pellets $51, delivered Minneapolis; oiled reground pellets $53.

Denver: Demand fair; trend steady; supply ample; $46.

ANIMAL FAT (STABILIZED)

Ft. Worth: Demand good; supply tight; prime tallow, tank cars 6¼¢ lb., drums 6¢ lb., f.o.b. north Texas packing plants, with returnable drums.

Boston: Demand and supply steady; tallow 6¾¢ lb.; yellow grease 5¾¢ lb.

Kansas City: Demand fair; trend firm; supply tight; stabilized prime tallow 6@6¼¢ lb.

Ogden: Supply ample; $6.75 cwt.

Louisville: Demand good; trend steady; supply ample; bleachable white 6¾¢ lb.; white tallow 6¾¢ lb.; yellow grease 6¼¢ lb.; all in tanks.

San Francisco: Demand fair; supply ample; bleachable fancy 6¾¢ lb.; yellow grease 5¾¢ lb.

St. Paul: Bleachable fancy market still climbing; gain of ⅛¢ since week ago; Feb. 16 price: 6¾¢ lb., f.o.b. producer's plant.

Chicago: Demand good; trend higher; supply fair; tank truck or carlots, bleachable fancy tallow $7 cwt., yellow grease $6.12½ cwt.

Atlanta: Demand good; trend stronger; supply limited; 5½¢ lb., f.o.b. Alabama and Georgia processing plants.

Salisbury, Md.: Demand excellent; supply limited; 6¼¢ lb., f.o.b.

BARLEY FEED

Los Angeles: Demand fair; trend steady; supply adequate; standard rolled $3.05 cwt., standard ground $3.05 cwt., both sacked.

Milwaukee: Demand fair; supply limited; trend unchanged; feed barley 95¢ bu., bulk; barley feed $36.50 ton, sacked; ground feed barley $42.50 ton, sacked.

Boston: Demand and supply light; $46.50, sacked.

Ogden: Supply good; rolled $45@46, whole $40@41.

Philadelphia: Demand slow; supply fair; $42.50.

Portland: Demand slow; trend easy; supply ample; $45.50.

San Francisco: Demand fair; supply ample; rolled $58, ground $57.

Baltimore: Demand and supply fair; trend unchanged; $46.50, sacked.

Chicago: Demand good; trend steady; supply fair; $36, sacked.

Seattle: Demand fair; trend steady; supply good; $46, truck lots.

Denver: Demand fair; trend steady; supply ample; $2 bulk, $2.20 sacked.

BENTONITE (SODIUM)

Cincinnati: Demand steady; supply adequate; f.o.b. Cincinnati, minimum 30 ton carloads: 80 granular $31.50, less than carlots $40; 200 mesh fine $31.50, less than carlots $40.

Chicago: Demand fair; supply ample; trend steady; f.o.b. Wyoming and South Dakota shipping points: 200 mesh $14 and net $13.75; fine granular (80 to 100 mesh) $14.25 and net $14; granular, 30 mesh $16.50 and net $16.25.

Denver: Demand fair; trend steady; supply ample; $24.50.

BLOOD FLOUR

Louisville: Demand fair; trend steady; supply good; $92.50@97.50, sacked.

BLOOD MEAL

Los Angeles: Demand slow; trend unchanged; supply adequate; $5.50 a unit of ammonia, sacked.

Ogden: Supply ample; $90.

Omaha: Demand very good; trend improving; supply short; 80% $115, sacked, Omaha.

Portland: Demand fair; supply ample; trend unchanged; $74.50@75.50, sacked.

Louisville: Demand fair; trend steady; supply good; $92.50@97.50, sacked.

San Francisco: Demand and supply fair; $6 a unit of ammonia, sacked.

Chicago: Demand and supply fair; trend steady; 80% protein $125, sacked.

BONE MEAL (STEAMED)

Ft. Worth: Demand good; supply sufficient; $100, sacked, f.o.b. Ft. Worth, local manufacture.

Los Angeles: Demand fair; trend steady; supply ample; imported $30.75, 20 ton lots, sacked.

Boston: Demand and supply steady; $100.

Portland: Demand fair; trend steady; supply adequate; $95@99.50, sacked.

Louisville: Demand slow; trend easy; supply light; $100@105, sacked.

Cincinnati: Demand slow; trend steady; supply fair; $105, sacked, Cincinnati.

San Francisco: Demand good; supply ample; $75, sacked.

Buffalo: Demand fair; trend strong; supply light; $105, sacked.

Chicago: Demand fair; trend unchanged; supply adequate; $97.50, sacked.

Seattle: Demand fair; trend steady; supply good; $92, f.o.b. car Seattle, sacked.

Denver: Demand fair; trend steady; supply ample; $112.50.

BREWERS DRIED GRAINS

Ft. Worth: Demand slow; supply sufficient; 26% protein $63.40, sacked, February.

Los Angeles: Demand good; trend steady; supply limited; $51.50.

Milwaukee: Demand limited; trend weaker; supply fair; $48 bulk, $57 sacked.

Boston: Demand good; supply short; 22% $58.10 bulk, 26% $60.50 sacked.

Philadelphia: Demand and supply fair; trend unsettled; $58.50.

Louisville: Demand dull; trend easy; supply improved; $56, sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $56.

San Francisco: Demand fair; supply ample; $51, sacked.

New York: $59 bulk, $67 sacked, Boston.

Chicago: Demand easier; trend firm; supply ample; 26% protein $45.

St. Louis: Demand fair; trend lower; supply ample; $50.

Buffalo: Demand fair; trend steady to lower; supply good; $57.60, Boston.

BREWERS DRIED YEAST

Los Angeles: Demand good; trend steady; supply limited; 10¢ lb., 5 ton lots; 11¢ lb., 1 ton lots; 12¢ lb., less than ton lots; all sacked.

Boston: Demand and supply steady; 11¢ lb.

Omaha: Demand fair; trend improving; supply plentiful; 10¢ lb.

Portland: Demand fair; supply ample; trend unchanged; 12@13¢ lb.

Louisville: Demand fair; trend steady; supply good; 10@10½¢ lb., sacked.

Cincinnati: Carlots 11¢ lb.; 5 ton lots 11¢ lb.; ton lots 11½¢ lb., all sacked.

San Francisco: Demand fair; supply good; 10¢ lb., sacked.

Seattle: Demand slow; trend steady; supply ample; $12 cwt., sacked.

Buffalo: Demand fair; trend steady; supply ample; $8.75 cwt.

Chicago: Demand fair; trend steady; supply ample; 9½@10¢ lb., carlots, sacked; 9¾@12½¢ lb., l.c.l.

Milwaukee: Demand fair; trend steady; supply ample; 10½@12½¢ lb., ton lots, sacked.

St. Louis: Demand fair; trend firm; supply ample; 9½@10¢ lb., carlots, sacked; 10½¢ lb., ton lots; 11½¢ lb., less than ton lots.

Pittsburgh: Carlots 10¢ lb.; 5 ton lots 11¢ lb.; ton lots 11½¢ lb., all sacked.

New York: Carlots 9½¢ lb.; 10 ton lots 10¢ lb.; 5 ton lots 10½¢ lb.; ton lots 11¢ lb., all sacked, f.o.b. New Jersey.

Denver: Demand fair; trend steady; supply ample; 9¢ lb., f.o.b. warehouse.

BUTTERMILK (CONDENSED)

San Francisco: Demand fair; supply good; $5 cwt., drums.

Los Angeles: Demand slow; trend steady; supply adequate; 5½¢ lb., 100 lb. lots; 4½¢ lb., 500 lb. lots; both in barrels.

Boston: Demand and supply steady; 4½¢ lb.

Ogden: Supply ample; $4.40 cwt., drum.

Philadelphia: Demand slow; supply fair; $4.25 cwt.

Louisville: Demand very dull; trend weak; supply nil; $4@4.25 cwt., in 500 lb. paper drums.

Chicago: Demand fair; trend firm; supply ample; 500 lb. barrels $3.05@3.25 cwt.

CALCIUM CARBONATE

Los Angeles: Demand fair; trend steady; supply adequate; flour $9.85, 20 ton cars; meal $10.20, 20 ton cars; both sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $7@7.50 cwt.

Chicago: Demand fair; trend steady; supply ample; fine grind, plain, 100 lb. bags $9.54; bulk, in hopper cars $7.54; bulk, in boxcars $8.04; granular grind $1 premium.

Minneapolis: Fine grind, 50 lb. bags $13.75; 100 lb. bags $13; bulk, boxcar $11.50; bulk, hopper $11; coarse grind $1 premium, delivered Minneapolis.

Seattle: Demand and trend steady; supply good; $14, ex-warehouse, sacked.

CHARCOAL

Boston: Demand slow; supply light; granular No. 6 $110.

San Francisco: Demand steady; supply ample; $141, sacked.

COD LIVER OIL (FORTIFIED)

Boston: Demand and supply steady; 500 D, 2,250 A 18½¢ lb.; 300 D, 3,000 A 20¢; 300 D, 8,250 A 18¢; 300 D, 1,500 A 16½¢.

New York: 1,500 A, 300 D 15½¢ lb.; 3,000 A, 300 D 19¢ lb.

COCONUT OIL MEAL

Los Angeles: Demand and trend steady; supply ample; copra cake $63.

Portland: Demand dull; trend steady; supply ample; $63.20.

San Francisco: Demand fair; supply ample; solvent $52, expeller $69.

Seattle: Demand fair; trend steady; supply ample; solvent type $68, f.o.b. car Seattle, sacked.

CORN OIL MEAL

Louisville: Demand slow; trend steady; supply normal; $57.55, sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $50.

Seattle: Demand good; trend firm; supply ample; $53, car.

CONDENSED FISH SOLUBLES

Los Angeles: Demand good; trend steady; supply limited; 2½¢ lb.

Boston: Demand quiet; supply adequate; $37.50@40.

New York: $35@40.

Denver: Demand fair; trend steady; supply ample; 3¢ lb.

CORN GLUTEN FEED AND MEAL

(All quotations for all cities are bulk basis, sacked basis $6 more)

Minneapolis: Feed $53.60, meal $72.60.
Atlanta: Feed $57, meal $76.
Birmingham: Feed $55.60, meal $74.60.
Boston: Feed $58.50, meal $77.50.
Chicago: Feed $47, meal $66.
Cleveland: Feed $54.90, meal $73.90.
Denver: Feed $57.20, meal $76.20.
Ft. Worth: Feed $55.70, meal $74.70.
Indianapolis: Feed $52.20, meal $71.20.
Kansas City: Feed $47, meal $66.
Louisville: Feed $52.60, meal $72.60.
New Orleans: Feed $56.90, meal $75.90.
New York: Feed $58.10, meal $77.10.
Norfolk: Feed $57.50, meal 76.50.
Philadelphia: Feed $57.80, meal 76.80.
St. Louis: Feed $47, meal $66.

COTTONSEED OIL MEAL

Ft. Worth: Demand fair; supply sufficient; 41% old process $62@63, f.o.b. mills Ft. Worth; carlots, solvent 2% fat added $56@57, delivered Ft. Worth; pellets $2 additional, hulls $23.

Los Angeles: Demand good; trend steady; supply light; $55@57.

Boston: Demand fair; supply adequate; $69.50.

Kansas City: Demand improved; trend steady; supply ample; 41% old process or solvent process $52@52.50, Memphis.

Ogden: Supply ample; 41% $61@63.

Omaha: Demand good; trend strong; supply tight; 41% solvent $60.50, delivered Omaha.

Wichita: Demand fair; supply ample; 41% old process $69, sacked.

Philadelphia: Demand and supply fair; $67.

Portland: Demand slow; trend firm; supply tight; $66.10.

Louisville: Demand fair to good; trend strong; supply normal; old process $62.10, new process $61.60, both sacked.

Cincinnati: Demand poor; trend steady; supply adequate; $58.60 in 40 ton carlots.

San Francisco: Demand fair; supply ample; 41% $57, 44% $62.

Seattle: Demand fair; trend firm; supply ample; $67, f.o.b. car Seattle.

Chicago: Demand fair; trend higher; supply light; Memphis basis: hydraulic $53, solvent $54.

St. Louis: Demand fair; trend steady; supply ample; solvent $56.

Memphis: Demand fair; trend steady to higher; supply ample; prime 41% protein, old process $52; new process, 41% protein $52.

Atlanta: Demand and supply good; trend stronger; 41%: $56, Georgia and South Carolina; $57, North Carolina; $55, north Alabama; $53, Mississippi and Tennessee producing mills.

Buffalo: Demand and supply fair; trend steady; $74, sacked, Boston.

Denver: Demand fair; trend steady; supply ample; $58.50.

CURACAO PHOSPHATE

New York: Minimum 14% phosphorus $43.50 sacked, $40.50 bulk, f.o.b. New Orleans, Jacksonville and Philadelphia.

D ACTIVATED ANIMAL STEROL (POWDERED)

Kansas City: Demand fair; trend steady; supply ample; 1,500 ICU 9¾¢ lb.; 3,000 ICU 11¢ lb.

Cincinnati: Demand fair; trend steady; supply ample; 1,500 ICU 11@12¢ lb.; 3,000 ICU 10¢ lb., warehouse.

D ACTIVATED PLANT STEROL (POWDERED)

Chicago: Demand fair; supply ample; 4,000,000 U.S.P. units per lb., 15¢ lb. in ton lots, less than ton lots 17¢ lb.; 12,000,000 units per lb., 5 tons to a carload 28¢ lb., ton lots and less 30¢ lb.

DEFLUORINATED PHOSPHATE

Coronet, Fla.: Minimum phosphorus 18%, minimum calcium 31%, maximum calcium 34%, maximum fluorine .18%; guaranteed uniform analysis; carlond $61.25, sacked, 100 lb. multiwall bags, bulk $58.25; truck load $62, sacked, in 100 lb. multiwall bags, bulk $59, f.o.b. Coronet, Fla.

Tupelo, Miss.: Minimum phosphorus 14%, minimum calcium 28%, maximum fluorine .14% $52, f.o.b. Tupelo in 100 lb. multiwall bags, $49 bulk.

Wales, Tenn.: Minimum phosphorus 18%, minimum calcium 33%, maximum 36%, maximum fluorine .18% $66 (or $3.67 per unit of P), f.o.b. Wales in 100 lb. multiwall bags, $3 less in bulk.

Butte, Mont.: Minimum phosphorus 18%, minimum calcium 32%, maximum calcium 36%, maximum fluorine .18% $81 (or $4.50 per unit of P), f.o.b. Butte, 100 lb. multiwall bags; bulk $78; truck lots of less than 10 tons $10 more, bagged or bulk.

Houston: Minimum phosphorus 19%, minimum calcium 32%, maximum calcium 35%, maximum fluorine .19% $69.35 net ton, f.o.b. Houston, 100 lb. multiwall bags; $66.35 bulk ($3.65 per unit of P).

Portland: Demand fair; trend steady; supply ample; $93.50@95 for product carrying a minimum of 18% phosphorus, 31.5% calcium and a maximum of 0.1% fluorine; $92@93.50, dock for a minimum of 10 ton lots.

Cincinnati: 18% phosphorus, carlots $74.30, ton lots $84.30; 14% phosphorus, carlots $62.50, ton lots $72.50, f.o.b. Cincinnati.

DICALCIUM PHOSPHATE

Trenton, Mich.: 18½% P $33, bulk, boxcar/hopper car; $36, bagged, in carloads or truck loads; $36, bagged, in less than carload lots; 21% P, $94.05, bulk, boxcar/hopper car; $97.65, bagged, in carloads or truck loads; $107.65, bagged, less than carload; all prices f.o.b. Trenton, freight equalized with nearest producing point.

Chicago: Bulk, carlots and truck loads, 18½% phosphate $78 and 21% phosphate $89; packed in 100 lb. papers, 10 tons or more, 18½% phosphate $81 and 21% $92; lesser quantities, 18½% phosphate $91 and 21% $102; above prices, per ton, f.o.b. Chicago Heights, Ill., or Nashville, Tenn.

Bonnie, Fla.: Minimum phosphorus 18½%, granular, $81 (or $4.38 unit of P), freight equalized from nearest producing point, carload basis; bulk carloads $3 less; in truck loads of less than 10 tons, $10 more. Western slope prices, for delivery at established railroad stations and by truck at regular feed mixing plants: California, Arizona, Nevada and Utah, $99.90; Washington, Oregon, Montana and Idaho, $107.15; bulk carloads $3 less; truck loads less than 10 tons, $10 more.

Columbia, Tenn.: Minimum phosphorus 18.5%, minimum calcium 24% $81, f.o.b. Columbia, in 100 lb. multiwall bags; freight equalized with nearest producing point, carload basis; bulk $3 ton less.

Texas City, Texas: Minimum phosphorus 18.5%, minimum calcium 26%, maximum calcium 23%, maximum fluorine .12%; carload and truck load $75.50, sacked in 100 lb. multiwall bags, bulk $72.50, f.o.b. Texas City.

Denver: Demand fair; trend steady; supply ample; $88.50, delivered, carload.

Cincinnati: 18½% phosphorus $88.80, bagged in carloads; $98.70, bagged in ton lots, f.o.b. Cincinnati; $81, f.o.b. producing points.

DISTILLERS DRIED GRAINS

Boston: Demand active; supply scarce; light $70, dark $71, both nominal.

Philadelphia: Demand slow; supply very light; dark $72.50.

Louisville: Demand good; trend steady; supply light; bourbon grains: light $64, dark $65, solubles $73.

Cincinnati: Demand fair; trend steady; supply adequate; $56.

San Francisco: Demand fair; supply ample; solubles $79, sacked.

Buffalo: Demand good; trend steady to higher; supply fair to poor; $73, Boston.

Seattle: Demand good; trend firm; none available; $71, delivered truck lots, sacked.

DRIED BEET PULP

Ft. Worth: Demand slow; offerings light; plain $60.20, sacked, 50 lb. bags.

Los Angeles: Demand good; trend steady; supply moderate; $49.90.

Milwaukee: Demand limited; trend slow; supply adequate; plain and molasses $54.25, Chicago basis.

Boston: Demand fair; supply adequate; $61, sacked.

Ogden: Supply good; $39@45.

Portland: Demand slow; supply adequate; trend unchanged; $47.58, sacked.

San Francisco: Demand good; supply fair; $44.80.

Denver: Demand fair; trend steady; supply ample; $65.

Buffalo: Demand fair to poor; trend steady; supply fair; $61.50, sacked, Boston.

Seattle: Demand good; trend steady; supply ample; $49, delivered carlots, sacked.

Atlanta: Demand fair; trend steady; supply limited; $60.22, sacked, delivered.

DRIED BUTTERMILK

Los Angeles: Demand fair; trend steady; supply ample; 13⅜@14¢ lb., sacked.

Milwaukee: Demand and supply limited; trend firm; $10.75 cwt., sacked.

Boston: Demand light; supply short; 14¢ lb.

Ogden: Supply ample; $17.25 cwt.

Louisville: Demand slow; trend easy; supply normal; 12@12½¢ lb., sacked.

San Francisco: Demand fair; supply ample; 13½¢ lb., sacked.

Chicago: Demand quiet; trend steady; supply fair; medium acid $11@11.25 cwt., sweet cream $11@11.25 cwt., both sacked.

Buffalo: Demand fair; trend steady; supply short; $11.30 cwt.

DRIED CITRUS PULP

Los Angeles: No offerings.

Boston: Demand and supply fair; $59.15, sacked, delivered.

San Francisco: Demand and supply fair; meal $48, sacked.

Buffalo: Demand poor; trend steady; supply fair; $40.50, sacked, f.o.b. Florida points.

Atlanta: Demand fair; trend weak; supply good; pulp $40@42.50, sacked; meal $37.50, sacked; both f.o.b. Florida processing plants.

DRIED SKIM MILK

Milwaukee: Demand and supply limited; trend firm; $12.75 cwt., sacked.

Los Angeles: Demand slow; trend steady; supply adequate; 15¢ lb., less than ton lots; 14⅜¢ lb., ton lots; both sacked.

Boston: Demand good; supply scarce; 13¢ lb.

Ogden: Supply good; $15.15 cwt., sacked.

Omaha: Demand very strong; trend stronger; supply very short; 12¢ lb.

Philadelphia: Demand slow; supply fair; $13 cwt.

Portland: Demand fair; supply ample; trend unchanged; 13¢ lb.

Louisville: Demand dull; trend steady; supply normal; 12@12½¢ lb., sacked.

Cincinnati: Demand fair; trend steady; supply adequate; 12@13¢ lb., sacked.

San Francisco: Demand and supply fair; 14½¢ lb., sacked.

Minneapolis: Price 25¢ under last week; $11.75 cwt.

Chicago: Demand slight improvement; trend steady; supply fair; $11@11.25 cwt., sacked.

Buffalo: Demand fair; trend steady; supply ample; spray $9.65 cwt.

DRIED WHEY

Ft. Worth: Demand fair; supply adequate; carlots, standard $5, sacked, delivered Ft. Worth; ton lots $5.25, f.o.b. warehouse Ft. Worth.

Los Angeles: Demand fair; trend steady; supply adequate; $5.18 cwt., carloads; $5.35 cwt., l.c.l.; both sacked.

Boston: Demand and supply good; 5¼@5½¢ lb.

Kansas City: Demand fair; trend steady; supply adequate; regular or partially delactosed $5.25 cwt., sacked.

Ogden: Supply ample; $6.90 cwt., sacked.

Omaha: Demand good; trend stronger; supply fair; $5.50 cwt.

Philadelphia: Demand slow; supply fair; $6.25 cwt.

Portland: Demand fair; trend steady; supply adequate; $5.75@6 cwt., sacked.

Louisville: Demand slow; trend easy; supply light; 5.75@6¢ lb., sacked.

Cincinnati: Demand fair; trend steady; supply adequate; $5.75 cwt., sacked.

San Francisco: Demand steady; supply good; $5.25 cwt., sacked.

Minneapolis: Supplies tighter than last week; demand fair; price steady at $5.15 cwt.

Seattle: Demand steady; trend easy; supply good; $5.85 cwt., ex-warehouse, l.c.l.

Chicago: Demand quiet; trend firm; supply fair; $4.75@4.85 cwt., sacked.

Denver: Demand slow; trend steady; supply good; $5.25, delivered.

FEATHER MEAL (HYDROLYZED)

Ft. Worth: Demand slow; supply sufficient; 85% protein $65@67 bulk, $67.50@69, sacked, delivered Ft. Worth.

Los Angeles: Demand good; trend steady; supply adequate; 90¢ a unit of protein, sacked.

Boston: Demand fair; supply light; $75, sacked.

Salisbury: Demand good; supply limited; $62, f.o.b.

Atlanta: Demand fair; trend steady; supply good; $65, f.o.b. Alabama and Georgia processing plants.

FISH MEAL

New York: 60% menhaden meal $92@94, sacked, f.o.b. shipping points.

San Francisco: Demand slow; supply ample; $1.50 a unit of protein.

Cincinnati: Demand fair; trend steady; supply adequate; $98.50.

Louisville: Demand slow; trend steady; supply light; $100@105, sacked.

Portland: Demand slow; trend steady; supply adequate; $1.55 a protein unit, sacked.

Omaha: Demand and supply good; trend improving; 60% menhaden $115, f.o.b. Omaha.

Ogden: Supply good; $1.05 a unit, f.o.b. Coast; 65% $105@108.

Boston: Demand and supply steady; $92.

Milwaukee: Demand limited; trend firmer; supply adequate; $108, sacked, Chicago basis.

Los Angeles: Demand very good; trend steady; supply very limited; local production, 60% protein $1.65 a unit, sacked.

Ft. Worth: Demand good; supply limited; sacked: 65% protein Peruvian $94; 60% protein menhaden $102, delivered Ft. Worth.

Salisbury, Md.: Demand good; supply limited; $90, f.o.b.

Denver: Demand good; trend steady; supply ample; $1.45 a protein unit.

Minneapolis: Canadian herring same price as last week, $1.35 unit, West Coast, subject to production; 60% West Coast blended up another $2 to $118, sacked, delivered.

Chicago: Demand and supply fair; trend higher; sacked: menhaden, East Coast $88@94, Gulf $88@94; menhaden scrap, East Coast $84@90, Gulf $84@90; Canadian herring meal $1.25@1.40 a unit of protein.

Seattle: Demand fair; trend firm; supply good; $1.45 a unit protein, f.o.b. truck Vancouver, B.C. (Canadian production).

Buffalo: Demand good; trend very firm; supply limited; 60% protein menhaden $105 bulk, $110 sacked.

Atlanta: Demand good; trend stronger; supply limited; 60% menhaden $93, sacked, f.o.b. Atlantic and Gulf ports.

HAY

Ogden: Supply good; $25 ton in the barn.

Wichita: Demand good; supply sufficient; prairie $24@27, alfalfa $32@34, baled.

Philadelphia: Demand slow; supply light; $25.50.

Louisville: Demand very dull; trend steady; supply good; local and nearby hay: No. 1 $30, No. 2 $28; straw $18@20; lespedeza hay: No. 1 $25, No. 2 $23.

Cincinnati: Demand poor; trend steady; supply adequate; second cutting alfalfa $35; No. 1 timothy $25; red clover $30; No. 1 timothy and clover mixed $30; straw $18.

Seattle: Demand fair; trend steady; supply good; U.S. No. 2 green alfalfa $37, delivered truck lots, baled.

HOMINY FEED

Milwaukee: Demand good; trend firm; supply limited; $40 bulk, $44.50 sacked, both Chicago basis.

Boston: Demand slow; supply ample; $51.

Kansas City: Demand slow; trend steady; supply ample; yellow hominy $34@34.50; white hominy $33@33.50.

Louisville: Demand dull; trend steady; supply light; $46@47, sacked.

Cincinnati: Demand fair; trend higher; supply adequate; $44.

Chicago: Demand easier; trend lower; supply fair; $40.50.

Buffalo: Demand and supply fair; trend steady to lower; $51, Boston.

Seattle: Demand good; trend firm; supply limited; $54, delivered carlots, sacked.

St. Louis: Demand poor; trend easy; supply ample; yellow $39.50.

Memphis: Demand poor; trend steady; supply ample; white $41.80, yellow $41.80.

LINSEED OIL MEAL

San Francisco: Demand fair; supply ample; $72.

Cincinnati: Demand poor; trend steady; supply adequate; new process $57, old process $62, Minneapolis.

Louisville: Demand fair; trend steady; supply normal; old process $77, new process $71, both sacked.

Portland: Demand dull; trend lower; supply ample; $86.50, sacked.

Philadelphia: Demand and supply fair; 34% $74.

Wichita: Demand fair; supply ample; 34% $75, sacked.

Omaha: Demand fair; trend strong; supply tight; 34% solvent $61.90; 32% old process $67.40, Omaha basis.

Kansas City: Demand fair; trend steady; supply adequate; 34% solvent process $55.50@56; old process $61@61.50, Minneapolis.

Boston: Demand slow; supply light; 34% $73.20, 32% old process $79.20.

Milwaukee: Demand and supply fair; trend firm; expeller $72.50, solvent $68, both sacked, Chicago basis.

Los Angeles: Demand fair; trend steady; supply ample; local production, 31% protein $71.

Ft. Worth: Demand slow; supply sufficient; 34% protein, extracted $72.70, February; $73.20, March-April.

Denver: Demand fair; trend steady; supply ample; $70.50 bulk, $75 sacked.

Minneapolis: Demand slow, but prices generally unchanged from last week; 34% solvent $56, 32% expeller $61.50.

Chicago: Demand fair; trend steady; supply ample; Minneapolis basis: solvent $55.50, expeller $61.50.

Seattle: Demand fair; trend steady; supply good; 34% protein (Montana) $85, delivered carloads, sacked.

LIVER AND GLANDULAR MEAL

Omaha: Demand and trend fair; supply plentiful; 65% $165, sacked, Omaha.

MALT SPROUTS

Cincinnati: Demand fair; trend steady; supply adequate; No. 1 $46.

MEAT AND BONE MEAL

Ft. Worth: Demand good; supply sufficient; meat and bone, 50% $80 bulk, $83 sacked, f.o.b. Ft. Worth.

Los Angeles: Demand excellent; trend firm; supply light; 50% protein $1.65 a unit.

Boston: Demand and supply steady; $1.30 a protein unit; converted, 50% $77.50.

Kansas City: Demand good; trend firm; supply tight; 50% $90.

Ogden: Supply good; 50% protein $85, sacked.

Omaha: Demand good; trend stronger; supply fair; $90.

Wichita: Demand heavy; supply insufficient; 50% $92.50, sacked, f.o.b. plant.

Portland: Demand fair; trend steady; supply adequate; $80, sacked.

Louisville: Demand fair; trend steady; supply good; $87.50@92.50, sacked.

Cincinnati: Demand excellent; trend steady; supply short; 50% meat and bone scraps $86, Cincinnati.

San Francisco: Demand fair; supply ample; $1.60 a unit of protein.

New York: 50% $77.50, 55% $82.50, New York.

Denver: Demand good; trend steady; supply scarce; $79.

St. Paul: Market stronger because of improved demand; only adequate supplies; price gain of $2@4 in week to $92@96, sacked.

Chicago: Demand and supply fair; trend firm; 50% protein $90, sacked.

Buffalo: Demand good; trend very firm; supply light; 50% meat scraps $87.50 bulk, $92.50 sacked.

Seattle: Demand good; trend steady; supply limited; $1.55 a unit protein, exprocessing plant, sacked.

St. Louis: Demand good; trend firm; supply limited; $88.

MILLFEED

Minneapolis: Easier tone because of less interest shown by buyers and heavy output in this market, and because of softness at Kansas City; sacked bran down $1@1.50 to $41@41.50, bulk $36; sacked middlings down $1 to $37, bulk $31@31.50; sacked red dog down $1 to $43.

Kansas City: Demand fair; trend easy; supply ample; sacked, bran $36@36.50, shorts $35.50@36; bulk, bran $30@30.50, shorts $29@29.50, middlings $29@29.50.

Wichita: Demand slow, with bran in better demand than shorts; supply adequate; basis Kansas City: bran $37.25@37.75, shorts $37.25@37.75, sacked; bran was unchanged, while shorts declined 50¢, compared with the preceding week; bulk middlings unchanged at $31.50@32, with fair demand.

Ft. Worth: Demand fair; offerings sufficient; bran, bulk $40.50, burlaps $45; gray shorts, bulk $40, burlaps $44.50; bulk middlings $40, delivered Texas common points; 50¢@$1 lower on bran, shorts and middlings $1.50 lower than previous week.

Chicago: Demand light; trend easier; supply heavier; standard bran $38, standard midds. $36, red dog $39.50.

St. Louis: Demand fair; trend easy; supply ample; sacked, bran $41, shorts $40.50; bulk, bran $35, middlings $34.

Omaha: Demand fair; trend easy; supply ample; sacked bran $37, sacked gray shorts $38, standard midds. $31.50, all Omaha basis.

Cincinnati: Demand fair; trend steady; supply adequate; bran $47, middlings $45.

San Francisco: Demand good; supply fair; millfeed $47, red bran $51.

Boston: Demand slow; supply adequate; bran $52.10, middlings $49.10.

Buffalo: Sales were quiet last week and prices headed sharply lower; downturn was accompanied by a slight rise in flour mill running time; both have receded from the premium of the past couple weeks and are now at or below western competition; incidentally, millfeeds are the only major ingredient to undergo the traditional February slump; sacked differential on bran and middlings widened out to $7 from $6.50; bulk bran ended $4.50@5 lower and sacked was down $2.50@3.50; bulk middlings dropped $6.50@7 and sacked was off $5.50@6; red dog, bulk and sacked, declined $4.50@5; quotations Feb. 15: bulk bran $39.50@40.50, sacked $47@48; bulk middlings $37.50@38, sacked $45@45.50; bulk red dog $40@44, sacked $47@51.

Philadelphia: Demand and supply fair; trend unsettled; bran $51, standard midds. $51, red dog $52.50.

Memphis: Demand fair; trend weak; supply ample; wheat bran $39.80, gray shorts $38.80, standard midds. $38.80.

Louisville: Demand fair; trend easy; supply good; bran $47.30, mixed feed $47.80, shorts $48.80, all sacked.

Seattle: Demand good; trend steady; supply limited; $43, delivered common transit points, carlots.

Portland: Demand slack; trend weak to lower; supply larger; $40@41.

Ogden: Supply ample; to Utah: red bran and millrun $38, middlings $43.

Denver: Demand fair; trend steady; supply ample; shorts $41.25, bran $41, millrun $41.25.

Los Angeles: Demand slow; trend easier; supply ample; standard millrun $46@46.50; red bran $50@51.

MINERAL FEED

Ft. Worth: Demand fair; supply adequate; all-purpose granules $85, block $95; mineral phosphorus granules $106, block $113; cattle-sheep mineral, 7% phosphorus granules $67, block $105; hog mineral phosphorus, 3½% granules $87, phosphorus 2% $72 (all in 50 lb. paper bags).

Ogden: Supply ample; $113 ton in 50 lb. blocks; $103 ton, granular, 50 lb. bags.

Wichita: Demand heavy; supply sufficient; all-purpose with iodine, 50 lb. blocks $97.50; 100 lb. bags $92.50, f.o.b. plant.

Portland: Demand fair; supply ample; trend unchanged; $44@45.

San Francisco: Demand steady; supply good; all-purpose with iodine $70, sacked.

Sioux City: 50 lb. mineral blocks 8.2% phosphorus $92; 7.5% phenothiazine sheep mineral blocks $4 each.

Seattle: Demand fair; trend steady; supply good; mixer mineral $48, all-purpose mineral $85, both ex-warehouse, sacked.

MOLASSES

Ft. Worth: Demand fair; supply sufficient; blackstrap 13¼¢ gal., f.o.b. Houston; truck $29.35, delivered Ft. Worth, seller's market price on date of shipment.

Los Angeles: Demand good; trend steady; supply adequate; $22.50, f.o.b. tank cars; $22.75, f.o.b. tank trucks.

Milwaukee: Demand fair; trend strong; supply limited; blackstrap 13¼¢ gal., f.o.b. New Orleans.

Boston: Demand and supply steady; 16½¢ gal., in tank cars.

Kansas City: Demand fair; trend firm; supply ample; blackstrap 13@13¼¢ gal., f.o.b. New Orleans.

Louisville: Demand slow; trend easy; supply normal; 13¢ gal., tank car lots, f.o.b. Gulf ports; down ¼¢ gal.

Cincinnati: Demand fair; trend steady; supply adequate; 13½¢ gal., New Orleans.

San Francisco: Demand and supply good; $25.75, f.o.b. cars Richmond, Cal.

New York: 16½¢ gal., Albany; 16¢ gal., Baltimore and New York; $32.20 ton, f.o.b. Buffalo.

Atlanta: Demand good; trend steady; supply limited; $22, f.o.b. Florida processing plants.

Buffalo: Demand and supply fair; trend steady; 16½¢ gal., f.o.b. Albany.

Denver: Demand and supply good; trend steady; $33.60, tank, Denver.

Seattle: Demand and supply good; trend firm; $25.75, f.o.b. Seattle, tank truck lots.

St. Louis: Demand slow; trend steady; supply ample; 13¢ gal., tank car, New Orleans.

Memphis: Demand fair to good; trend steady to higher; supply ample; blackstrap 13@13¼¢ gal., tank car, f.o.b. New Orleans, and $29.50 ton, delivered Memphis, truck.

Minneapolis: No change from last week; blackstrap $33, tank truck, delivered; beet $30, blend $31.50.

OAT PRODUCTS

Ft. Worth: Demand slow; supply sufficient; 10% protein oat millfeed $42.20; reground $26.30, sacked.

Los Angeles: Demand slow; trend unchanged; supply adequate; local production, pulverized $66, sacked.

Boston: Demand and supply steady; white pulverized $54.20, sacked; reground oat feed $26.25, sacked.

Philadelphia: Pulverized whites, demand slow, supply fair $48.30; domestic, demand slow, supply light $25.50; Canadian oat feed, demand fair, supply light $31.50, sacked, nominal.

Portland: Demand dull; trend easy; supply ample; No. 2 extra heavy $55.

Louisville: Demand fair; trend easy; supply normal; reground $24.90, rolled $79.90, feeding $74.40, pulverized $50.40, crimped $66.40, all sacked.

Cincinnati: Demand poor; trend steady; supply adequate; pulverized white oats $45@52.

Minneapolis: Market unchanged from last week except for 50¢ drop in pulverized to $41.50, sacked; sacked feeding rolled steady at $74; sacked feeding oatmeal $62; sacked crimped $58.50; sacked reground oat feed $24.

Chicago: Demand slow; trend easier; supply fair; reground oat feed $12.50; No. 1 fine ground feeding oatmeal $68; feeding rolled oats $70.

Memphis: Demand poor; trend weak; supply ample; 3¼% protein, reground oat feed $24.

Seattle: Demand and supply fair; trend steady; $57, delivered truck lots, 38 lb. or better.

OYSTER SHELL

San Francisco: Demand fair; supply ample; local $15, eastern $26, sacked.

Cincinnati: Demand fair; trend steady; supply adequate; 80 lb. bags $23.85, 50 lb. bags $24.10, 25 lb. bags $26.35.

Louisville: Demand good; trend steady; supply normal; in 80 lb. papers $23.95, in 50 lb. papers $24.20, in 25 lb. papers $26.45, all sacked.

Portland: Demand fair; supply ample; trend unchanged; $27.50@35, sacked, for western and eastern supplies, respectively.

PEANUT OIL MEAL

Milwaukee: Demand limited; supply fair; trend stronger; 26% $47 bulk, $51 sacked, both Chicago basis.

Atlanta: Demand good; trend steady; supply limited; 45%: $51 for solvent, $53 for expeller process, f.o.b. Alabama and Georgia producing mills.

PEAT MOSS

San Francisco: Demand and supply fair; $3.65 bale.

Cincinnati: Demand good; trend steady; supply good; $3.45 a bale, f.o.b. Cincinnati.

Portland: Demand somewhat improved; trend steady to strong; supply adequate; $30@3.15 per 5.6 cu. ft. bale.

Philadelphia: Demand good; supply light; $3 bale, f.o.b. pier.

POTASSIUM IODIDE, U.S.P.

Cincinnati: Demand good; trend steady; 90% KI in calcium stearate or carbonate mixtures: 250 lb. drums $1.35, 200 lb. in 100 lb. drums $1.35, 100 lb. drums $1.38, 25 lb. drums $1.41, f.o.b. Cincinnati.

Chittenango, N.Y.: Demand good; trend firm; supply adequate; standard trace mineral blends, 90% U.S.P. KI and 10% calcium stearate, magnesium carbonate or calcium hydroxide: 100 lb. drums $1.42 lb.; 200 lb. and up $1.40 lb., delivered basis.

POULTRY BY-PRODUCTS

Ft. Worth: Demand good; supply limited; $87@90, nominal, sacked, f.o.b. north Texas plant.

Los Angeles: Demand good; trend steady; supply adequate; $1.45 a unit of protein, sacked.

Boston: Demand good; supply tight; $87@88.

Salisbury, Md.: Demand excellent; supply limited; meal $79, f.o.b.

Atlanta: Demand good; trend stronger; supply very limited; $80, f.o.b. Alabama and Georgia processing plants.

RIBOFLAVIN

Cincinnati: Trend steady; feed grade (in feed supplements) 4¢ gm. in less than ton lots in 3.36 to 16 gm./lb. mixtures; 3¢ in ton lots or more, freight prepaid or paid to destination.

RICE BY-PRODUCTS

Los Angeles: Demand slow; trend steady; supply adequate; California production, high fat content, bran $52.50, sacked.

San Francisco: Demand good; supply ample; bran $41, sacked.

Ft. Worth: Demand good; supply very scarce; rice bran $37@38, f.o.b. south Texas rice mills, sacked; hulls $4.50, sacked.

Atlanta: Demand good; trend steady; supply very limited; $45, sacked, delivered.

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SCREENINGS

Buffalo: Demand fair; trend steady to lower; supply adequate; ground, sacked $38, New York; unground, bulk $31.50, New York.

Cincinnati: Demand fair; trend steady; supply adequate; unground grain screenings $24@25.

Chicago: Demand good; trend firm; supply fair; ground grain $31.50; Canadian $26, sacked.

Minneapolis: Market static, except for $1 drop in Canadian to $21 because of slow demand; trading still generally slim; domestic ranges unchanged: lights $9@13, mediums $14@21, heavies $22@31; 15% flax screenings, nominal $37.

SORGHUM

Seattle: Demand and supply good; trend firm; $46.50, delivered carlots.

Ft. Worth: Demand fair; offerings light; No. 2 yellow milo $2.05@2.07 cwt., delivered Texas common points.

Los Angeles: Demand good; trend firmer; supply tighter; milo $2.22½ cwt.

Ogden: Supply good; milo $41@42.

SOYBEAN OIL MEAL

Atlanta: Demand good; trend steady; supply good; 44% $66, delivered.

Seattle: Demand good; trend steady; supply ample; $79.60, delivered carlots.

St. Louis: Demand good; trend steady; supply ample; 44% $65.

Memphis: Demand fair; trend steady to higher; supply ample; prime 44% solvent $68.50, f.o.b. Memphis.

Ft. Worth: Demand good; supply sufficient; 44% $68.30@69.50 February, $69.30@70.50 March, $70.50@71.50 April-May; 50% $73.30@75 February, $74.30@76 March, $75.30@77 April-May.

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633 Board of Trade
KANSAS CITY, MISSOURI

Los Angeles: Demand steady; trend firmer; supply adequate; $80.60@81.60.

Milwaukee: Demand and supply fair; trend stronger; $57.50, Decatur.

Boston: Demand steady; supply ample; 44% $58, 50% $62.50, both f.o.b. Decatur.

Kansas City: Demand fair; trend strong; supply adequate; 44% solvent process $58@58.50, Decatur.

Chicago: Demand only fair; trend much higher; supply adequate; Decatur basis, 44% protein, unrestricted billing $62.50 and E.T.L. $59; 50%, unrestricted $66.50, and E.T.L. $63.50.

Ogden: Supply good; 41% protein $70@71, 50% protein $75@76.

Omaha: Demand good; trend strong; supply ample; 44% $64.90, delivered Omaha.

Wichita: Demand good; supply ample; 44% $69, 50% $74, sacked; 44% $65, 50% $70, bulk, f.o.b. Wichita.

Philadelphia: Demand and supply fair; trend unsettled; 44% $57.50, Decatur.

Portland: Demand slow; trend higher; supply tight; 44% $60.60.

Louisville: Demand fair to good; trend strong; supply normal; $70.20, sacked, up $2.50.

Cincinnati: Demand good; trend higher; supply adequate; $59.50@60, Decatur.

San Francisco: Demand fair; supply ample; $79.10.

Denver: Demand good; trend steady; supply ample; 44% $70.

Minneapolis: Market observers say speculators continue to support price for beans, meal and oil futures, but demand for spot meal doesn't warrant the advance seen this week in meal; crushers cutting output, reduced output expected to advance prices; this week's advance on 44% was pegged at about $3, putting the latest level at $55.50, Decatur; 50% up $1 to $59.50, Decatur.

TANKAGE

Louisville: Demand fair; trend steady; supply good; 60% protein $90@95, sacked.

Wichita: Demand heavy; supply insufficient; 60% $92.50, sacked, f.o.b. plant.

Omaha: Demand good; trend stronger; supply fair; $90.

Kansas City: Demand good; trend firm; supply tight; 60% digester $90.

St. Louis: Demand good; trend firm; supply limited; $90.

Chicago: Demand fair; trend firm; supply ample; 60% protein $90, sacked.

Ft. Worth: Demand good; supply limited; 60% digester $87.50, sacked, Ft. Worth.

St. Paul: Demand good; supplies adequate; price gain of $3@4 in week to $93@97, sacked.

UREA FEED COMPOUND

Woodstock, Tenn.: Minimum 42% nitrogen, 262% protein equivalent; $100, bagged, f.o.b., freight equalized with nearest producing plant; bulk $96.

Lima, Ohio: Minimum 42% nitrogen, 262% protein equivalent; $100, f.o.b. bagged.

Pryor, Okla.: Minimum 42% nitrogen, 262% protein equivalent; $100, f.o.b. bagged; $96, bulk cars or trucks, freight equalized with nearest producing point.

Belle, W. Va.: Minimum 42% nitrogen, 262% protein equivalent; $100, f.o.b. bagged; $96, bulk cars or trucks, freight equalized with nearest producing point.

LaPlatte, Neb., and South Point, Ohio: Minimum 42% nitrogen, 262% protein equivalent, $100 ton, f.o.b., bagged; $96 ton, bulk, cars or trucks, freight equalized with nearest producing point.

Hamilton, Ontario: Minimum 42% nitrogen, 262% protein equivalent, delivered destination, $100 bagged, $96 bulk, carload or truck load, plus freight from nearest producing point to destination.

VEGETABLE AND ANIMAL FAT (HYDROLYZED)

Ft. Worth: Demand good; supply limited; 5%¢ lb., f.o.b. north central Texas.

VITAMIN E FEED SUPPLEMENT

Cincinnati: Demand good; trend steady; 50 lb. or more $1.40, less than 50 lb. $1.45, freight allowed to destination.

WHEAT GERM MEAL

Buffalo: Demand and supply fair; trend steady to lower; commercial grade $63.50, sacked, f.o.b. Buffalo.

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WASHINGTON

(Continued from page 1)

panel of industry observers who tackled various questions confronting feed men as they pause in the midst of today's fast-paced changes and do some long-range planning.

The panel discussion was a highlight of last week's convention of the Washington State Feed Assn. in Bellingham.

The over-all question under discussion was, "What's ahead for the feed industry?"—about as broad as you can get. However, the panel members each aimed at specific developments in the decade ahead, as related to the feed industry in general and to the Pacific Northwest in particular.

The Washington group's 34th annual convention was held Feb. 10 at the Hotel Leopold, following the two-day Pacific Northwest Feed Mill Production School.

The panel discussion was moderated by Len Hitchman of the Ralston Purina Co. Members were Oakley Ray, American Feed Manufacturers Assn., Chicago; Henry Fors, Fors Feed Mills, Tacoma; Roger Berglund, Feedstuffs, Minneapolis; Richard Beeler, Western Feed & Seed, San Francisco, and Dr. H. S. Wilgus, Ray Ewing Co., Pasadena, Cal. (who discussed the effects of Food and Drug regulations).

Summaries of the panel presentations follow:

WILL THERE BE A FEED MANUFACTURING INDUSTRY IN THE FUTURE?

This is a pretty basic question, and the answer, according to Oakley Ray, is that the amount of commercial feed sold in the future can be expected to increase, despite current trends to on-the-farm milling and the use of concentrates.

Mr. Ray, who is market research director for the American Feed Manufacturers Assn., Chicago, predicted that concentrates will become a larger proportion of total commercial feeds. Complete feed tonnage probably will also increase, he said, but not so fast as concentrate tonnage.

The AFMA economist also indicated the likelihood of more coordination among feed companies, farmers, processors, food retailers and others concerned with the production and marketing of agricultural commodities.

Commercial feed output increased from 25.5 million tons in 1948 to 40 million tons in 1959—an increase of more than 50%, Mr. Ray pointed out. Commercial feed consumption per grain consuming animal unit increased 41% during this period, in addition to an increase in number of livestock (including poultry) raised.

Consumption of formula feed is expected to continue to increase, Mr. Ray noted. U.S. population may increase 20% from present levels to a total of 219 million by 1970. Also, per capita consumption of most livestock and poultry products is increasing.

Mr. Ray pointed out that there is still considerable room for improvement in rations fed by many producers, and quantities of formula feed used per animal unit are expected to show further gains.

There will be some increase in use of concentrates by farmers who produce grain, Mr. Ray continued. And, he added, it is likely that concentrates will become a still larger proportion of total manufactured feeds.

Feed manufacturing by farmers will increase, he said, but most of these farmers will use a commercial concentrate. "Only a few of the largest farmers will be able to economically go all the way to a vitamin premix or to manufacture of feed 'from the ground up'," Mr. Ray said. "Most farmers who have to buy and transport grain will find it advantageous to buy a complete feed instead of doing their own milling.

"Most feed companies will fail if they cannot produce and distribute a complete feed more efficiently than farmers who have to buy and transport all ingredients."

Commenting on coordination among producing and marketing segments, Mr. Ray said that successful farmers will more and more determine their market before starting to produce and will then make their production plans, which will include feed requirements. The feed industry, he said, will provide increasing amounts of assistance in locating the end product market and then helping to plan production and marketing of the exact quality and quantity of the end product to be delivered at a specified date.

CAN BROILERS AND EGGS BE PRODUCED IN THE PACIFIC NORTHWEST TO COMPETE WITH COMPETITION FROM OTHER AREAS?

The answer to this question, said Henry Fors, is an emphatic "yes"—if the industry continues to recognize and apply changes that are necessary to keep pace or forage ahead.

Actually, said Mr. Fors, most would not feel that there is a real danger of permanently losing the poultry industry to outside competition. The real question, he said, is, "Can we as individuals or as companies meet the local competition that will be necessary to meet outside competitors?" He added. "Isn't it a matter, not of whether the job is going to get done, but how it will be done and who will do it? This is the question in my mind."

Mr. Fors, who is president of Fors Feed Mills, Tacoma, went on to discuss the area's general situation in relation to other areas, and he posed the "challenge of changes which I feel are inevitable and desirable.

"The first step necessary in accepting the challenge of change, in my opinion, is complete integration from the producer to the retailer," said Mr. Fors. "No longer can we afford the luxury of conflicting interests between one link of the production cycle and the other wherein one segment of the industry prospers at the expense of whoever is most vulnerable. There is no longer room for separate profits for hatchery, feed store, grower and processor in the fryer business. The egg business is not much different. Primary breeding is perhaps the only function that will continue to resist integration . . .

"A word about integration—don't fight it; join it. Decide how you can become a partner in it."

Mr. Fors said that strict vertical integration is not likely soon because of capital requirements. However, he noticed the coming together of separate functions in the chain from feed man through producer, processor, handler and retailer—with risk shared, volumes stabilized, and responsibility for cost control and distribution shared, along with the profits from the sale of the commodity to the next stage beyond integration.

"A new feed concept probably should be generally accepted now," he declared. "You will no longer sell feed—you will convert feedstuffs to food products . . . This is most definite immediately in poultry meat and eggs.

"We are going to have to see ourselves producing for a market. If you are now selling feed to a group of independent producers who bear their own marketing burdens (assuming you make no change), it is likely that in a few years you'll be out of the feed business . . . This trend is pronounced all over America—it has only begun. Here in Washington we have made initial merging efforts, but the combining into larger integrations will come sharply in the next few years."

Mr. Fors warned, however, that just integrating and doing a good job of merchandising the end product are not enough. He emphasized that

"no integrated operation has a chance of survival in either eggs or broilers unless the farm management is as good as or better than that of the competitors."

Using specific figures to underline the importance of good management on the farms, he observed that the field service man is no longer a sales tool for the feed industry. "Now," said Mr. Fors, "he is your production manager, and he had better be trained for the job as carefully and diligently as you trained your mill production manager in the past. His influence on the results your customer turns in can amount to many dollars per ton, rather than the 10, 25 or 50¢ per ton savings we work so hard to achieve in our mill operations.

While he discussed fryers primarily, Mr. Fors said he feels that in a few years integration will be as important in egg production as it is today in fryers. It will move a little more slowly because of the longer production cycle, he said, but "the inherent cost-cutting advantages of integrated production steps, plus fixing of responsibility of production cost on the last handler will not only be desirable but essential if we are to compete."

On the question of regional competition, Mr. Fors said that southern broiler areas have some real production edges, such as lower labor and feed costs and more advanced integration. However, he cited factors in the Northwest which he feels offset the southern advantage if full use is made of them. One of the most important advantages in Washington, he noted, is the Fryer Commission program which has won strong consumer acceptance of Washington fryers. Among others are a fresh product in the local market, moderate temperature and less disease problem.

WILL FEED MANUFACTURERS BE EXCLUSIVELY IN THE FEED BUSINESS IN 1970?

The obvious answer, based on the present, is "no," said Roger Berglund of Feedstuffs, Minneapolis, and it seems certain that there will be more integration or coordination of one type or another, particularly in poultry and to some greater extent in livestock. At the same time, there are likely to be at least some who specialize in just one phase of the whole production-marketing complex.

Mr. Berglund cited current examples of various types of operations and production and marketing developments in the feed and related industries in different parts of the country. He noted that there are considerable differences among different regions, but among the general observations were these:

—There no doubt will be more vertical integration or coordination of production and marketing, particularly in poultry. This will be greatest where there are needs for new capital, where there are most opportunities for improvements in efficiency and where agriculture is now less well developed. Some feed firms may integrate near their own mills as it becomes more difficult to serve a wide area in what has been a conventional way.

—As financing and credit problems increase, as greater efficiency or marketing opportunities are sought, as some bigger feeders turn to making their own feed, more feed men will be their own best customers. They'll tend to get more directly into their own feeding operations. However, some will stick mostly with contracting; they still won't want to invest large sums in production facilities.

—There will still be some feed specialists, but there may be less of the "in-between" type of operation. That is, on one hand some will move still more deeply into integrated or coordinated arrangements. On the other hand, some will specialize in feed pretty strictly, doing a minimum of financing or integrating and concentrating on making and distributing feed as efficiently as possible. They are betting that there will continue to be some strong independent livestock and poultry producers. There may be some increase in group buying from feed specialists.

—Some of those concentrating on feed will still provide management advice and other services which they feel will justify their margins. Some may broaden their lines of products for animal agriculture, and there appears to be a trend toward more "package" production programs or systems. However, feed is more and more a production product in the over-all job of producing and marketing animal products, and not a consumer product that can carry expensive promotion and distribution costs. As one feed man put it, sales and marketing expenses that seem essential today, will give way under pressure of the total economics of producing the end product, and the feed man can figure on an average of at least 50% more tonnage per man and per dollar by 1965.

While there will be more direct feeding and contracting, it may be noted that all operators have costs of doing business. Integrators may have certain advantages, but they won't take over entirely.

—Perhaps agriculture and the feed industry are going through a cycle which will eventually find a return to at least some additional specialization again. Once farmers were completely integrated and did everything themselves, including mixing feed. Then feed specialists developed and made feed better and more efficiently. Now the trend in some cases is to more farm mixing or to integration by processors and others. Possibly, as some integrators have to concentrate more capital and know-how on end product marketing, they will go back to buying efficiently produced feed again. And some big producers, as they concentrate capital and effort in larger, more specialized operations, will turn feed supply problems back to efficient specialists. This has already happened in some instances. Developments in feed technology and government regulations also may be a factor.

—In any event, it may be concluded that solutions will not be the same for all. One feed executive advises: "Specialize in the things you can do well. You can't whip the big ones by doing everything they do. You can't make your dollars or your management stretch. But you can whip them in our own area or specialized field, by doing things better, faster, more effectively and more efficiently."

WHAT WILL BE THE 1970 PICTURE IN THE FEED MANUFACTURING BUSINESS IN THE MATTER OF SIZE OF THE MANUFACTURER?

In the next 10 years the size of the feed plant will be established by the kind of operation required as well as by the nature of the market. This was pointed out by Richard M. Beeler of Western Feed & Seed, San Francisco, who went on to suggest types of mills likely to prevail in the years ahead in the West.

"By physical characteristics," said Mr. Beeler, "there will be two main types of mills. One will be the larger local mill which builds formulated feeds from the ground up, employing its own nutritionists and laboratories and premixing on the spot. The other will be the local mill which buys formulation service and premixing and performs the functions of processing local grains, mixing the finished feeds, marketing and field service, warehousing and transportation. I personally believe there will be considerable growth in this latter direction because it employs both centralization and decentralization according to the demands of economics and customer services.

" . . . You will reach the conclusion that there will certainly be more feed plants in the future."

Mr. Beeler cited developments which have led to more decentralization in the feed industry throughout the U.S., and in the West there has been more decentralization than in other areas.

There will continue to be many feed plants, each serving a fairly small area, he said. The moment a feed manufacturer begins to deliver beyond the economic limits of his territory, someone builds a plant there and takes care of the business. In some areas, there is a tremendous concentration of animal production, and the individual plant might be quite large, but competition comes into play and the "lush market is split among a half dozen or more mills," Mr. Beeler observed.

He said that at present there are about 2,100 feed manufacturers of all kinds in the 13 western states, including feedlots and other plants which are part of integrated operations. Their combined annual output is 13.5 million tons. The average per plant is 6,400 tons. Assuming decentralization and competition will limit the average plant size to some 7,000 tons, there will be nearly 3,000 mills of all kinds in the West by 1970, said Mr. Beeler. This would be an average, with considerable variation between the largest and smallest. A mill in a concentrated livestock area might be much larger than the isolated plant in a remote location with small numbers of livestock. Perhaps the largest will be specialized mills which are part of integrated operations, like the big cattle feedlots.

"Some plants will be operated by growers in an integrated operation, some will be local plants of a large feed company and some will continue to be operated by cooperatives," Mr. Beeler said. "I do firmly believe that feed manufacturing will become more technical and more specialized and that this will discourage participation by growers, grocerymen and other integrators."

Mr. Beeler predicted that the West's feed production will increase about 50% by 1970, with a 30% increase in Washington.

HOW CAN WE SHAPE PUBLIC ATTITUDE TOWARD FEED MEDICATIONS?

This question was handled by Dr. H. S. Wilgus, The Ray Ewing Co., Pasadena, Cal. (A more detailed review of Dr. Wilgus' remarks at the Pacific Northwest Feed Mill Production School will appear later.)

Dr. Wilgus noted that at the moment there is a sort of "hysterical fear" of Food and Drug regulations in the feed industry. However, he said, the industry need not fear these developments if feed men adopt the "right mental attitude and do the best they can to comply."

He reminded the feed men that a single voice carries little weight in connection with current FDA-industry problems, and he noted the importance of the work being done by the feed industry liaison committee—made up of representatives of the American Feed Manufacturers Assn. and the Grain & Feed Dealers National Assn.—in trying to ease current industry problems resulting from FDA interpretations and regulations.

Dr. Wilgus said that there may be several years of confusion, but eventually there will be a sounder industry because of use of medications more effectively.

He predicted that there will be an integration of veterinarians into the feeding—not just feed—industry, and these vets will, among other things, supervise crews and people involved in industry operations.

Commenting on public relations problems, he cited as an example of public relations efforts the current Poultry and Egg National Board program of presenting factual information to doctors on poultry products.

FISH MEAL

(Continued from page 1)

tion as a fish meal exporter. (Feedstuffs, Jan. 21, 1961, page 8.) Close to 500,000 tons were said to have been exported by the South American country in 1960, and about 65,000 tons of this entered the U.S. for the feed trade last year. Some quarters believe Peru has the capacity to produce close to a million tons annually.

Now, for the first time, the government of Peru and Peruvian fish interests have agreed to an export quota of 600,000 metric tons annually. (Feedstuffs, Feb. 11, quoted a source which indicated the quota would be 800,000 tons. This was incorrect.) In addition, the Peruvian processors have formed a "consorcio" which became official Feb. 15. This group is expected to be a central selling agency for Peruvian meal.

It is reported that about 90% of the Peruvian fish industry has lined up under the consorcio arrangement. They will operate with sub-quotas and will sell imports through the consorcio agency. Importers in this country and elsewhere in the world are waiting to see what market actions will develop out of this new move. There has been approximately a $10@12 ton advance in the price of Peruvian meal, f.o.b. Peru, since the first of the year.

CHICKS

(Continued from page 1)

Markets were affected by disruption of trading in many areas due to snow storms and extreme cold, it was reported. At the close of the month markets were somewhat unsettled, pending price and volume of government purchases of whole egg solids. The government announced intentions to buy whole egg solids Jan. 24.

The number of layers Feb. 1 totaled 299,109,000, down 4% from the same date in 1960 and the lowest of record for the date, according to USDA. Numbers of layers Feb. 1 were down from a year earlier in all regions except the West. Decreases from last year were 8% in the West North Central, 7% in both the East North Central and South Central, 5% in the North Atlantic and 1% in the South Atlantic states. In the West layer numbers were up 6%.

During January, the nation's farm flocks laid 5,137,000,000 eggs, compared with 5,433,000,000 last year, a decrease of 5%.

Grain Banking Bill Set for Minnesota

ST. PAUL — Legislation to sanction grain banking in Minnesota is expected to be recommended for passage by the agriculture committee of the Minnesota state senate.

As explained by Sen. John L. Olson, Worthington, Minn., one of the sponsors, the bill would permit owners of feed mills with storage capacity to accept grain to be held until the farmer needs it for feed.

Provisions of the bill originally included one that the grain might be comingled at the feed mill but the farmer depositor must get back grain of a grade equal to that shown on his receipt. However, an amendment by the senate committee provides that if a lesser grade is used in the mixed feed, the farmer-owner must be compensated for the differences.

The bill provides that only warehousemen already licensed to buy grain may obtain a license to engage in grain banking. The annual fee would be $10 per location. The grain banker would also be required to post a $1,500 bond with the state's railroad and warehouse commission.

Chicks Placed in Principal Broiler Areas

(000's omitted)

Week ending	Maine	Conn.	Penn.	Ind.	Ill.	Mo.	Del.	Md.
December 10	1,101	428	790	765	61	669	1,587	1,927
December 17	1,079	418	691	820	116	686	1,616	1,998
December 24	1,025	458	756	731	93	678	1,823	1,855
December 31	1,123	462	787	771	65	704	1,940	2,041
January 7	1,168	421	850	696	47	729	1,853	2,111
January 14	1,120	439	778	644	140	756	1,845	2,204
January 21	1,125	509	586	622	51	743	1,899	2,283
January 28	1,143	441	832	596	112	739	1,860	2,299
February 4	1,161	415	878	641	98	921	1,960	2,380
February 11	1,177	524	897	707	106	855	2,070	2,400

Week ending	Va.	W. Va.	N.C.	S.C.	Ga.	Fla.	Ala.	Miss.
December 10	842	410	2,991	324	5,921	224	2,748	2,368
December 17	940	423	2,985	305	5,705	252	2,955	2,376
December 24	1,096	358	3,122	316	5,716	219	2,865	2,407
December 31	1,069	461	3,150	299	5,875	250	2,956	2,335
January 7	1,062	523	3,357	323	6,286	298	3,099	2,433
January 14	1,072	516	3,386	294	5,996	264	3,295	2,474
January 21	977	517	3,327	332	5,963	255	3,159	2,384
January 28	1,118	406	3,479	297	6,127	256	3,466	2,507
February 4	1,040	375	3,659	290	6,783	270	3,672	2,724
February 11	1,199	369	3,834	400	7,211	260	4,032	3,020

Week ending	Ark.	La.	Texas	Wash.	Oregon	Calif.	Total 22 areas 1960-61	Total 22 areas 1959-60
December 10	3,555	422	1,945	256	212	1,263	30,809	29,054
December 17	3,814	395	2,120	246	270	1,265	31,473	29,029
December 24	3,966	416	1,901	228	225	1,352	31,606	25,952
December 31	4,129	474	2,054	260	261	1,229	32,715	31,212
January 7	4,055	442	2,288	325	224	1,226	33,816	32,359
January 14	4,006	433	2,145	307	279	1,284	33,677	32,401
January 21	4,205	464	2,149	308	241	1,224	33,323	32,145
January 28	4,375	498	2,299	289	261	1,218	34,618	33,444
February 4	4,421	507	2,499	345	309	1,310	36,658	34,222
February 11	4,694	496	2,549	359	273	1,293	38,725	34,706

MONTANA

(Continued from page 6)

went on test last fall. Amounts of hay being tested are 0, 2 and 6 lb. per day. There are two lots getting 2 lb. of hay daily, with one on steam-rolled barley and on on dry-rolled. The lots on 0 and 6 lb. of hay receive steam-rolled barley. Initial weight of the steers was around 850 lb. Two pounds of supplement per day are fed. Results to date indicate that steers fed 2 lb. of hay are doing the best. Those on 2 lb. of hay are gaining faster (3.08 vs. 2.96 lb. per day up to Jan. 7) when fed steam-rolled barley than when fed dry-rolled. Those on no hay and steam-rolled barley showed a daily gain of 2.95 lb. Animals on 6 lb. of hay had a lower rate of gain, 2.69 lb.

Another test being conducted at present has steers being fattened on a full feed of steam-rolled barley, about 2 lb. of chopped alfalfa hay per day and 1 to 2 lb. of a safflower pellet or a 20% protein pellet. After 84 days, average daily gains for four lots of 50 steers being fed a safflower pellet are 2.59, 2.72, 2.81 and 2.85 lb. per head per day. Averages for four lots fed a 20% protein pellet are 2.72, 2.68, 2.78 and 2.62. To date, Dr. Thomas said, it would appear that a safflower pellet fortified with calcium and vitamin A will give satisfactory results in a high-barley ration.

In commenting on research and barley feeding, Dr. Thomas mentioned that feeders should consider feedstuffs other than just barley if they are available. He mentioned beet pulp for one thing and noted that some tests have shown barley and beet pulp better than barley alone.

He also mentioned that some barley-fed steers have shown signs of rumenitis.

Dr. Thomas went on to point out, too, that it is possible that a high level feeding of antibiotics, vitamin A, phosphorus or protein at the start of the feeding period or immediately prior to the feeding period may be of considerable benefit in getting steers off to a good start in the feedlot.

"In this space age," he said, "we are expecting optimum gains and increased feed utilization; we must get more nutrition into our animals in every pound of feed. . . .

"We must strive for fast gains throughout the feeding period, and these gains must be economical."

FAT — CALCIUM — VITAMIN —NEEDED FOR GREATER FEEDLOT PERFORMANCE?—Dr. R. B. Grainger of Monsanto Chemical Co., St. Louis, presented data on fat, calcium and vitamin A to stimulate thinking about their future nutritional need and role in increasing the performance of feedlot cattle for greater intake, increased efficiency and greater dollar return to the feeder. Many questions, he said, remain to be clearly answered by definitive, well controlled experiments under feedlot conditions.

With 11 to 12% protein in a fattening ration, there are no data indicating energy has been raised to an extent that protein becomes a limiting factor in cattle performance, Dr. Grainger said. Under the "total-concentrate" programs utilizing barley, it is difficult to formulate a ration containing less than 11% protein. It then is indicated that the first limiting factor is the intake of feed per day and/or the energy density of the feedlot ration. With a minimum of roughage and full intake by feedlot cattle, the remaining means of increasing energy consumption is by addition of animal or vegetable fat. Recently there has been a stimulation of interest in addition of fats to fattening rations for cattle and sheep.

Dr. Grainger went on to discuss various research reports on fat use. "From the data available in the literature," he said, "the increase in energy density by use of fat in a cattle fattening ration does not generally decrease feed intake as does an increase in grain on a high roughage ration, but feed efficiency is increased due to increased gain on the same intake. In the work of Bohman and Erwin quality of roughage appears to be related to efficient utilization of dietary calories.

"Another consideration of use of fat calories is the maintenance of the body weight-calorie intake relationship. During a feeding period, intakes do not increase with the increase in body weight; therefore an increase of energy density of the fattening ration would be necessary to maintain this ratio. The unanswered question is—how high can a feeder go in energy density with use of fat? Is 10% the limit, or is it too high? Of course, economics of fat to cereal grain energy coupled with feed efficiency is a governing factor."

Dr. Grainger, formerly at the University of Kentucky, cited work indicating that quality of roughage, roughage - concentrate ratio and calcium content are related to level of fat that can be successfully used. Work with sheep showed that fat could be increased as roughage level decreased. As level of fat is increased, a quantitative increase in calcium is necessary to maintain the non-fat supplemented dry matter digestibility with the increase of energy density of the diet. Research has shown that an increase in fat in sheep rations decreased apparent and true digestibility of calcium.

The role of calcium becomes two-fold—(1) to facilitate efficient utilization of total dietary calories on high levels of supplemental fat and (2) insure adequate calcium absorption to satisfy requirements of the growing steer during early phases of a feeding period.

Dr. Grainger went on to say that increased performance or increased metabolic activity of the animal coupled with decrease in carotene in fattening rations as roughage has been decreased, has focused renewed interest in vitamin A. He cited Purdue work on vitamin A, with greater gains on the highest level, although the trend in gains did not closely follow the vitamin A level. He also mentioned that nitrate is converted to nitrite in the rumen and that subsequent nitrite absorpion may possibly affect vitamin A metabolism. Nitrite in vitro will also rapidly oxidize carotene as well as vitamin A.

There remains to be conducted, he said, a feedlot trial with coupled vitamin A and nitrate levels to determine if there is an effect on gains and vitamin A liver storage.

Dr. Grainger also referred to some as yet unreleased Illinois rat work on nitrite, vitamin A and carotene.

NEWER ADVANCES IN RUMINANT NUTRITION—"To get better utilization of rations by ruminants, we must first get the high microbial populations to do the job and then stimulate them to produce the right kind of acids for maximum utilization of all the acids by the animal," said Dr. R. A. Rasmussen of the Peter Hand Foundation, Chicago.

Dr. Rasmussen first outlined some pelleting studies and some Peter Hand and Maryland research on ruminant rations. He cited, among other things, Maryland work indicating greater steer gains with ground and pelleted hay and heated corn. The changes in acetic and propionic acid production in the rumen were noted, and Dr. Rasmussen explained that propionic acid makes an animal use acetic acid more efficiently. A considerable saving in the energy (fat producing) value of the ration results from the presence of propionic acid. This, he said, is easily explained through known biochemical facts. The propionic acid is necessary to allow the acetic acid to enter the oxidative cycles of the body.

"Coming again to the differences in production secured from beef cattle and sheep rations," he said, "the better performance must be due at least in part to a higher propionic acid production, for we found a three-fold increase in propionic acid production through the use of 'C. F. Sheep' (a Peter Hand product) with our farm lambs."

Dr. Rasmussen also mentioned the value of propionate in ketosis prevention and cure.

Before discussing developments in volatile fatty acid research, Dr. Rasmussen commented, "While the present abnormal situation of excess grains and high priced hays exists, we can continue to use the cow and sheep as grain converters. However, we should remember that under usual circumstances, the ruminant is a converter of roughage. Thus, we should learn more about unlocking the energy of the fiber to this animal, for in a sense fiber is just concentrated starch. In pounds of meat, high grain rations at best produce only 1 lb. of meat for 6 lb. of grain, while we can obtain two to three times that much meat with the hog or the chicken."

ENZYMES, KELP AND DYNAFAC FOR FATTENING CATTLE—Dr. I. A. Dyer of Washington State University noted that enzymes are specific in function as well as in the conditions necessary to function. Nutritionists should know the optimum rate of breakdown or synthesis of the various nutrients and enzymes being produced in order to intelligently supplement with the correct enzyme and the correct level. These conditions probably account for the variable responses to enzymes to date, he said.

Three Washington tests with a protetolytic-amylolytic combination of enzymes (Agrozyme) has resulted in average increase of 0.20 lb. per head per day and reduced feed per pound of gain by about 0.35 lb. In general, the enzymes increased performance more on barley rations than on similar corn rations. Furthermore, the response at the beginning of the feeding period is generally greater than at the end.

Dr. Dyer said a survey of 54 trials with all types of enzymes showed 36 positive results and 16 negative results and two cases of no difference. The averages were a 0.09 lb. improvement in daily gain and a feed efficiency improvement of 36 lb. per 100 lb. of gain.

Dr. Dyer went on to present background information on kelp (a seaweed) and explain that it supplies some of almost every nutrient, being particularly high in mineral content, and also contains enzymes.

In Washington tests, Norwegian kelp has increased rate of gain an average 0.22 lb. and resulted in a 4% feed saving. Increases in gain have been rather consistent while feed efficiency has been erratic. It is not now known which of the nutrients are contributing to increased gains, but Dr. Dyer's tentative results of work on this question indicate the beneficial effect is from the organic portion of kelp. Work is being done with barley and beet pulp rations.

Dr. Dyer cited a survey of 51 experiments with dynafac indicating that gain is inversely proportional to level of roughage. In general, he said, best results are obtained with high energy rations. The greatest increase in gain is on barley type rations. He noted that in the West rations are often higher in energy, and good responses have been obtained. Data, he said, may suggest that dynafac interferes with cellulose digestion in the case of high roughage rations.

IS BARLEY JUST "BARLEY" IN A FEED RATION?—Prof. R. F. Eslick, an agronomist at Montana State, told the feed men that there appear to be differences in barley varieties as feed. And he went on to cite examples in support of this contention.

He said that although tests reported in the paper are inconclusive in terms of livestock feeding, perhaps a few conclusions may be made as follows:

1. Significant barley variety differences in feed value may be demonstrated with laboratory animals. The general prevalence and magnitude of the difference are not known.
2. Environment will induce differences within a barley variety that will result in significant differences in feed value to laboratory animals. The most generally accepted relationship of environmentally induced differences in test weight to feed value would appear to be open to question.
3. Preliminary experiments indicate that hulless barley does not respond in a ration for laboratory animals as predicted from chemical analysis.

"It is my contention," he said, "that differences in feed value of barley do exist and that barley is not just 'barley' in a feed ration."

New Mexico Fire

TUCUMCARI, N.M. — A fire destroyed the single-story, half-block-long storage building of the Addington Grain & Feed Co. here. It raged out of control for two and a half hours. Firemen were able to save the company's elevator, however.

Damage to the building and loss of feed and grain totaled between $400,000 and $500,000, in the estimation of Kenneth George, manager of the firm.

MARKETS

(Continued from page 2)

concerned over the way that soybeans have advanced and some are fearful over the possible impact of high bean meal on their price tags for the commercially mixed product. While meal advanced about $5 per ton this past week, part of this has been offset by generally easier prices for many of the other constituent feeds.

Mills generally are operating on a full five day week with but little variation either way.

South Central

Feed manufacturers reported that business continues to be fairly slow this week, but volume so far this month is ahead of the same period a year ago. The general feeling is that demand will remain dull until dealers begin to stock up on starter feeds.

Hog feed volume has been easing for several weeks but a mild pickup in cattle feed deliveries has helped to maintain mill output. Egg feed sales are fairly good as are sales on dairy concentrates to be mixed on farms.

Reports indicate that there has been no significant change in mill operating time. Most plants are on a five day, 40 hour basis.

Pacific Northwest

Abnormal spring-like weather that is making farmers and consumers happy has definitely cut Oregon, Washington and Idaho formula feed sales below average levels for this time of year. Representative mixers reported that poultry mashes were in best demand, but they, too, faced somewhat below normal winter feeding needs.

Regional feed quotations averaged barely steady during quiet trading. Listings appeared on the mixed side or were about unchanged to somewhat easier on the average. Trade sources reported that mixers and feeders were cautious in their buying, which was limited to filling nearby requirements.

In the oilseed division, there was a $1 ton advance for soybean meal and cottonseed meal, while linseed meal values declined 50¢ ton. Wheat millfeed quotes declined $1 ton with representative millers reporting that the light available supplies more than satisfied the slack domestic and export demand.

Alfalfa meal listings held unchanged and about steady, but alfalfa hay markets turned soft because of mild weather reducing feeding needs and quotations were barely unchanged to $2 lower at the outside of the range.

Whole feeding grain listings were mixed. Corn and barley quotes were softer at the close while grain sorghums finished strong to slightly higher.

Mountain States

Dealers report that continued fair weather is keeping cattle on the ranges and that cattle feeding units are down in volume from the same week last year when snows covered the grasslands.

Turkey feeding is starting to pick up as the birds grow bigger. But, sheep feeding is off. Prices are generally lower than at this time last year.

Ohio Valley

Ohio Valley manufacturers of formula feeds were virtually unanimous this week in declaring that sales peaks and valleys for their products have disappeared and are unlikely ever to return. This situation, however, rather than being a cause for alarm, is being looked upon as a new trend that is bound to prove advantageous for every segment of the feed industry, including ingredient and equipment suppliers, as well as manufacturers.

Several noted that hundreds of valley farmers, who, for many years, had been average to large-scale producers of poultry during spring and summer months, had suffered such heavy losses from over-production two years ago, that they since either quit poultry raising entirely, or were now hatching baby chicks on year-round schedules for poultry and egg markets of grocery chains.

As a spokesman for one manufacturer noted: "During the last two years, we have been booking a steadily increasing volume of orders for egg mashes, as compared with the lack of such orders during the fall and winter months in previous years."

Other manufacturers noted that, while there may be fewer customers now, these farmers are much more firmly established economically, and therefore in much better position to purchase the equipment—and feeds—that are necessary to insure successful operations.

All of this appears well substantiated by the fact that sales of formula feeds are currently being maintained at a sufficiently steady pace to insure 40-hour weekly production schedules.

While production of farm animals was reported this week as below previous estimates, supplies are said to be adequate for the retail demand, which apparently has not as yet been affected by the rising industrial unemployment.

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Poultry, Feed Men Oppose Arkansas Bill

LITTLE ROCK—Segments of the Arkansas poultry and feed industry are lining up against a bill introduced in the general assembly to require that only registered veterinarians treat animal illnesses.

The bill was sponsored by Rep. Virgil T. Fletcher of Saline County.

Although it is still not clear how the measure would affect the poultry industry, John Haid, general manager, Arkansas Poultry Federation, said it is considered a "bad bill."

He said the general feeling is that it will not apply to the poultry industry. But he warned that the bill is couched in such general terms that a broad interpretation might result in the poultry industry being affected.

The measure specifies that livestock owners may treat their own stock. However, it also specifies that no one but veterinarians may treat animals for pay.

HALES & HUNTER

(Continued from page 6)

manager, is known in the poultry industry for having served as extension specialist in Indiana and later as editor of Broiler Business and Turkey World magazines before his appointment as manager of the company's poultry feeds department.

Victor Holt, now field sales manager, served as territory manager for Hales & Hunter Co. for several years and most recently acted as poultry specialist for three sales regions. Previous to joining Hales & Hunter he was sales and promotion manager for a feed company located in Atlanta, and previous to that was district sales manager for an Oklahoma concern.

Japanese Visitors Tour Nutrena Farm

MINNEAPOLIS — Production systems for livestock and poultry were the center of keen interest for a six-man Japanese feed grain mission which toured the Cargill-Nutrena Research Farm at Elk River, Minn.

The group, on a month-long swing through the U.S., spent an afternoon looking over the experimental facilities at the farm and getting answers to questions from Dr. Cloy Knodt, research farm director.

Dr. Knodt explained to the group that research at the farm not only includes feeds and feeding programs but also buildings and equipment, management methods and marketing of end products. Farmers, he said, need help in such things as choosing strains of poultry, vaccination and other health measures. Thus, a "systems research" concept governs experimental activities at the farm.

Controlled Lighting

The visitors were shown flocks of layers on controlled lighting tests ("stimulighting"), which Dr. Knodt said have shown increased profits of 10¢ per bird annually. They also were told of outstanding results obtained by the Coccivac vaccination method of combatting coccidiosis. Some 41,000 birds have been vaccinated at the farm, and none have shown coccidiosis symptoms in up to 24 months time, Dr. Knodt said. Before the vaccination program was started, extensive losses from the disease had occurred at the farm.

The visitors showed considerable interest in this information as coccidiosis also is a problem in Japan.

The tour also included inspection of the Pigloo system for swine in which sows are placed in isolation in individual huts before farrowing. Comparisons with central farrowing systems, also at the farm, show that the Pigloo method reduces diseases, losses and labor costs, Dr. Knodt said.

Sponsored by the U.S. Feed Grains Council, the U.S. tour helped acquaint the Japanese agricultural leaders with grain production and marketing, feed manufacturing, nutrition and disease research and feeding in several stops across the country.

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(THIS ARTICLE APPEARED IN FEEDSTUFFS, OCT. 29, 1960)

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